



**SW310  
USER MANUAL**

**Arima Computer Corp.  
Building Your Competitive Advantage**

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Release Date: Oct. 2005



## Technical Support

If a problem arises with your system during installation or operation and is unable to be resolved from the user manual, consult the following list of resources for help:

- Contact the place of purchase for help. This is the recommended solution as they can provide the quickest assistance.
- Visit Arima Computer Corp. website for up to the minute FAQ, guides and updates. The website can be found at: <http://www.arima.com.tw/server>
- Or contact our support staff at: [server@arima.com.tw](mailto:server@arima.com.tw)

## About this User Guide

This manual contains some special icons that accompany special sections that are meant to help you along in the installation process. The special sections contain useful and/or critical information that you should know. Watch for these icons as you read through the manual.

Type of icons:	Description:
NOTE 	This icon indicates useful and timely information that will aid you in the setup.
WARNING 	This icon indicates information on dangerous and/or costly behavior to avoid.

## Safety Instruction

- Keep this manual for future reference.
- Keep the equipments in a safe, cool, dry place.
- Perform the installation on a dry, flat surface.
- Ground yourself by touching a plugged-in power supply, which displaces static electricity.
- Adjust the power source to the proper voltage before connecting the equipment to the power outlet.
- Place the power cord in such a manner as to ensure that no one can step on it or trip over it.
- Always unplug the power cord when performing installation.
- Do not have liquid nearby as electrical shock can occur if liquid spills onto the equipment.
- Pay attention to the warnings in the installation instructions when appropriate.
- In the following cases, do not try to fix the problem yourself, contact a party in Technical Support
  - The power cord or plug is damaged.
  - Liquid has been spilled onto the equipment.
  - Obvious sign of damage can be detected on the equipment.



**Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.**

# Chapter 1. Getting Started

## 1.1 Congratulations

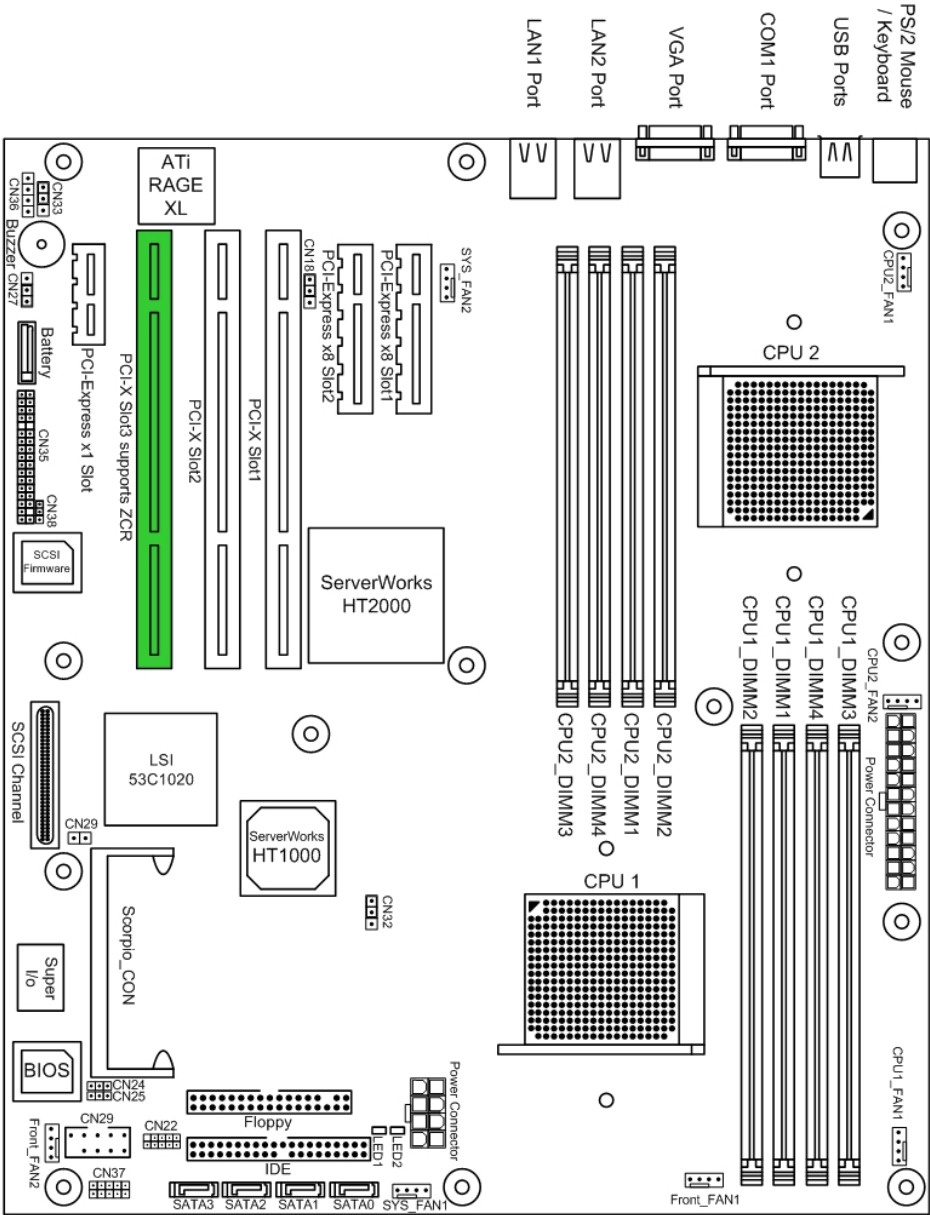
You have in possession one of the most powerful and versatile 2-way AMD Opteron processor solutions, the SW310. Powered by cutting edge ServerWorks HT2000 and HT1000 chipsets, SW310 efficiently utilizes the combined strength of 2000MT/sec HyperTransport, two PCI-X slot and integrated SATA-II controller, to name just a few. SW310 supports independent buses for PCI-X slot as well, providing the most efficient bus management to date. It provides versatility, performance, value and dependability for today's computing environment. In just a couple of pages, a detailed specification will provide you with a comprehensive view of the capabilities of SW310. Thank you for purchasing Arima Computer Corp. family of products.

## 1.2 Unpacking

Arima Computer Corp. provides a number of accessories for your convenience. Check for the following items that come with your motherboard:

- 2 sets of CPU retention units
- 2 SATA-II Data Cable / 1 SATA power cable
- 1 Ultra320 SCSI cable
- 1 Cable Kit (including 1 x Floppy cable, 1 x IDE cable, and 3 x jumpers)
- 1 I/O shield
- 1 Driver CD
- 1 Quick Installation Guide

1.2.1 Quick Installation Guide



The Latest BIOS, Manual, Memory AVL, Drivers and Utility can be downloaded from <http://www.arima.com.tw/server>

**CN27 Clear CMOS Header**

1-2	2-3
Normal (default)	Clear CMOS

**CN33 Onboard VGA Select Jumper**

1-2	2-3
VGA Enabled (default)	VGA Disabled

**CN18 PCI-X Slot Clock Select Jumper**

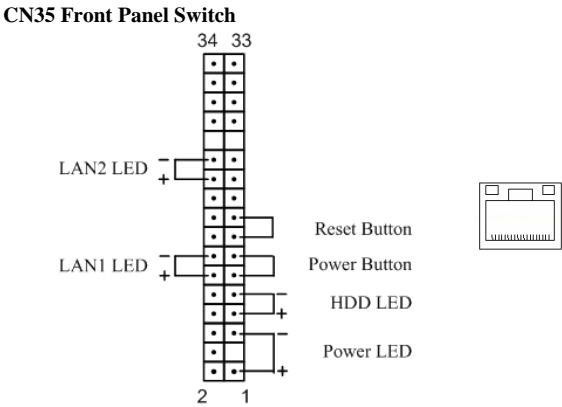
1-2	2-3
100 MHz Enabled	133 MHz Enabled (default)

**CN32 PCI-X-ZCR Slot Clock Select Jumper**

1-2	2-3
100 MHz Enabled	133 MHz Enabled (default)

**CN38 SCSI Select Jumper**

1-2	2-3
SCSI Enabled	SCSI Disabled



Recommended Memory Configurations		
1 DIMM	H1 Bank: Slot 1 or Slot 3 (This only provides 64-bit memory access)	
2 DIMMs	H1 Bank: Slot 1, 2 or Slot 3, 4	
4 DIMMs	Single Processor	H1 Bank: Slot 1, 2, 3, 4 *
	Dual Processor	H1 Bank: Slot 1, 2 or Slot 3, 4 H2 Bank: Slot 1, 2 or Slot 3, 4
6 DIMMs	H1 Slot 1, 2, 3, 4 * H2 Slot 1, 2	
8 DIMMs	H1 Slot 1, 2, 3, 4 * H2 Slot 1, 2, 3, 4 *	

\* To support full speed of DDR400, please use [Single, Single, Single, Single] or [Double, Double, Single, Single] or [Single, Single, Double, Double]. Besides, DDR400 is supported by CPU rev C0 and later.

**CN30 COM2 Header**

Pin	Description	Pin	Description
1	DCD	2	DSR
3	Serial In	4	RTS
5	Serial Out	6	CTS
7	DTR	8	RI
9	GND		

**CN21 USB Header**

Pin	Description	Pin	Description
1	VCC 1	2	VCC 2
3	Data - 1	4	Data - 2
5	Data + 1	6	Data + 2
7	Ground 1	8	Ground 2
9		10	NC/Key

**CN37 SATA LED Header**

Pin	Description
1	SATA0 LED
3	SATA1 LED
5	SATA2 LED
7	SATA3 LED

**CN36 Speaker PIN Header**

Pin	Description
1	Speaker
2	Buzzer
4	Speaker Power

LAN Connector Indicator Light	
Indication	Meaning
LED off	No link
Left LED Green	Active
Right LED Green	Link



## 1.3 Features Highlight

### CPU:

- Supports high productivity 2-way AMD Opteron processors configuration
- Supports Single and Dual Core AMD Opteron processor

### CHIPSET:

- Runs state of the art ServerWorks HT2000 and HT1000 Chipsets

### SYSTEM MEMORY:

- Eight 184-pin DDR 400 memory slots
- Up to 32GB system memory size

### EXPANSION SLOTS:

- Supports PCI-Express X8, X1 and 64 -bit PCI-X slots

### STORAGE:

- Total support of hard disk formats from SATA II to SATA to ATA

### INTEGRATED LAN CONTROLLER:

- Dual Gigabit Ethernet Ports

### SYSTEM MANAGEMENT:

- SMBIOS 2.3.3 and DMI 2.0 compliant
- 64 bit OS ready
- Soft Power-down
- Multiple boot support (with BIOS Boot Specification v3.1 (BBS) support
- Wake on LAN

## 1.4 Motherboard Specification

### Processors

- ❖ Dual uPGA 940 sockets
- ❖ Dual onboard 4-phase VRD
- ❖ Supports one or two AMD Opteron 200 series processors
- ❖ Supports Single and Dual Core AMD Opteron processor
- ❖ Supports 2000MT/s HyperTransport

### Chipsets

- ❖ ServerWorks HT2000 and HT1000 chipsets
- ❖ Supports two independent PCI-X buses
- ❖ National Semiconductor Super I/O PC87417 chip

### Memory

- ❖ 4+4 184-pin 2.6-Volt DDR DIMM sockets
- ❖ Dual channel memory bus
- ❖ Four-way interleaved memory banks (pair of DIMMs required)
- ❖ Supports DDR-400/333/266 memory
- ❖ Supports Registered ECC type memory modules only
- ❖ Supports up to 32GB

### Expansion Slots

- ❖ Two PCI-Express X8 slot
- ❖ One PCI-Express X1 slot
- ❖ Three 64-bit 133/100MHz PCI-X Slots
- ❖ Total of six usable slots

### ServerWorks HT1000 Integrated SATA II

- ❖ Independent DMA operation on 4 ports
- ❖ DMA Transfers up to 1.5Gb/s

### ServerWorks HT1000 Integrated ATA

- ❖ Provides one PCI bus master channel for up to two enhanced IDE devices
- ❖ Support for UDMA 100/66/33 IDE drives and ATAPI compliant device

### ServerWorks HT2000 Integrated LAN Controller

- ❖ ServerWorks HT2000 dual channel Gigabit Ethernet controller
- ❖ Two RJ-45 connectors with LEDs
- ❖ PXE option ROM solution

### Integrated U320 SCSI Controller (Optional)

- ❖ LSI 1020A Single-Channel Ultra320 SCSI controller connected PCI-X bus
- ❖ NVRAM support RAID
- ❖ Two 68-pin SCSI connectors
- ❖ Supports LSI Zero Channel RAID (ZCR) solution (LSI Logic MegaRAID SCSI 320-0 ZCR) – card not included
- ❖ Double transition clocking for 320 MB/sec throughput on each channel

### Integrated Graphics Controller

- ❖ ATI RADEON RAGE XL PCI graphics controller
- ❖ 8MB Frame Buffer of video memory

### ServerWorks HT1000 Integrated USB 2.0

- ❖ Four USB 2.0 ports (two rear panel connectors and one header)

- ❖ Header support up to 2 USB devices

#### Super I/O

- ❖ National Semiconductor Super I/O PC87417 chip
- ❖ One floppy connector supports two drives
- ❖ PS/2 mouse and PS/2 keyboard rear panel connectors
- ❖ Two 9-pin serial ports (one rear panel connector and one header)

#### Rear Panel I/O

- ❖ Stacked PS/2 mouse and PS/2 keyboard rear panel connectors
- ❖ Stacked two USB-2.0 connectors
- ❖ One 9-pin serial connector
- ❖ One DB15 Video connector
- ❖ Two RJ-45 connectors with LEDs

#### BIOS

- ❖ 4Mb Phoenix BIOS
- ❖ Legacy USB support
- ❖ MP 1.1 & 1.4 compliant
- ❖ SMBIOS 2.3.1 and DMI 2.0 compliant
- ❖ Soft Power-down
- ❖ Multiple boot support (with BIOS Boot Specification v3.1 (BBS) support)

#### System Management

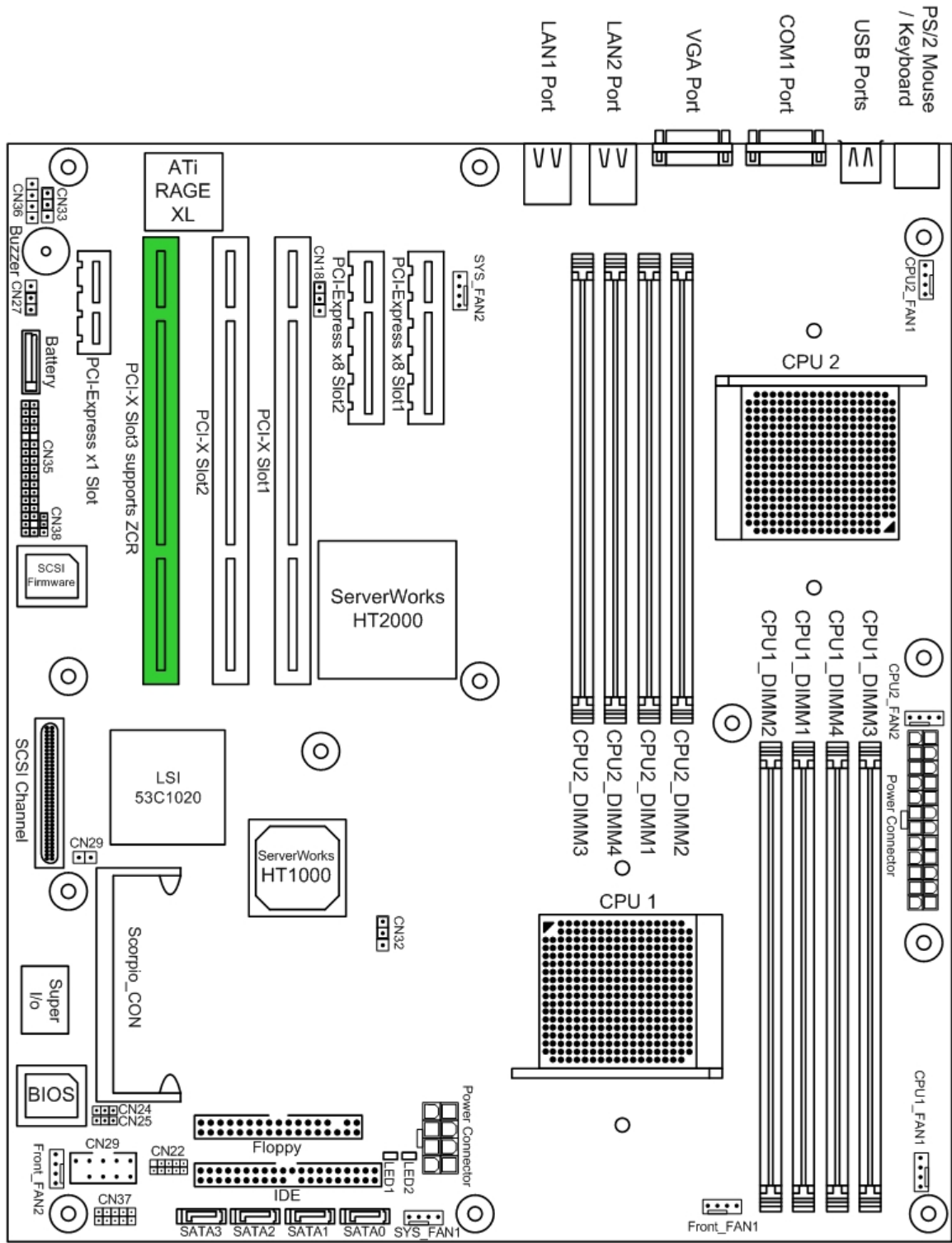
- ❖ SMC by Arima Scorpio Server Management Card (optional)
- ❖ MiniPCI connector
- ❖ IPMI 2.0 compliant (IPMI 1.5 fully compliant + Serial over Lan ready)

#### Form Factor

- ❖ SSI form factor with size: 12" X 13" (10 layers)
- ❖ EPS 12V power connectors (24pin + 8pin)

## 1.5 Motherboard Layout [major components]

The following diagram indicates all the major components of the motherboard.



## Chapter 2. Hardware Installation

### 2.1 Mounting the motherboard

#### !INSTALLATION WARNING!

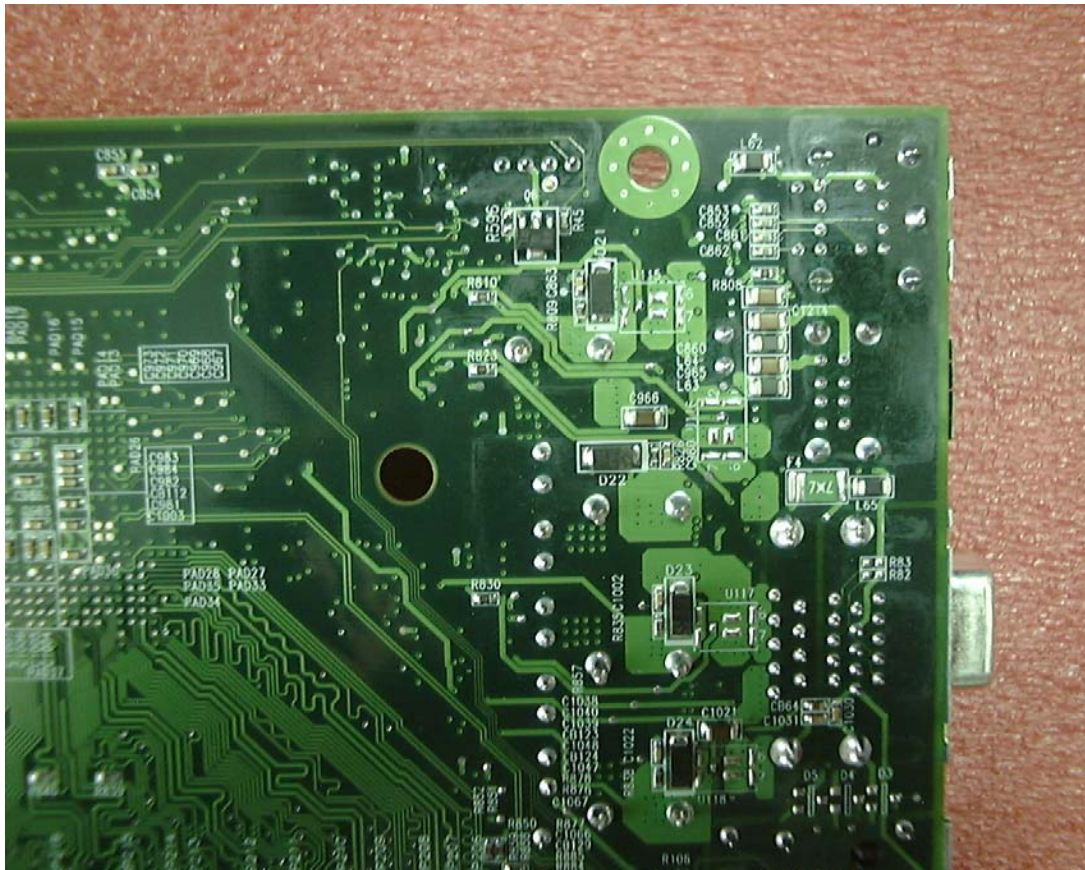
##### **Use Caution When Installing the ServerBoard into the System Chassis**

The components underneath the PS/2 Mouse/Keyboard connectors around the mounting hole are very **FRAGILE** and can be knocked off of their soldered positions, resulting in **IRREPARABLE DAMAGE** during installation when sliding the board into a system chassis.

Gently install the ServerBoard into the chassis, and use a Mylar Sheet to cover and protect the underside of the ServerBoard during installation. Take care **NOT** to scrape the bottom of the ServerBoard on the chassis stand-offs and mounting holes.

These components are necessary for many different operations, including the Mouse and the Keyboard. If you damage any of these chips, one of the symptoms is that the ServerBoard will **NOT** respond to key strokes through the PS/2 port and the ServerBoard will have to be replaced. Other symptoms include the loss of response or functionality in any of the rear I/O ports. Contact your authorized dealer for more information.

The Damage noted here in this WARNING may require the ServerBoard to be replaced. Due to the Nature of the Damage, this may be considered **Out-of-Warranty Damage**. Make certain that ALL documented procedures are followed correctly.





## 2.2 Installing the processor

SW310 operates best when dual AMD Opteron processors are in use. When using only one processor, install it in CPU1 socket.

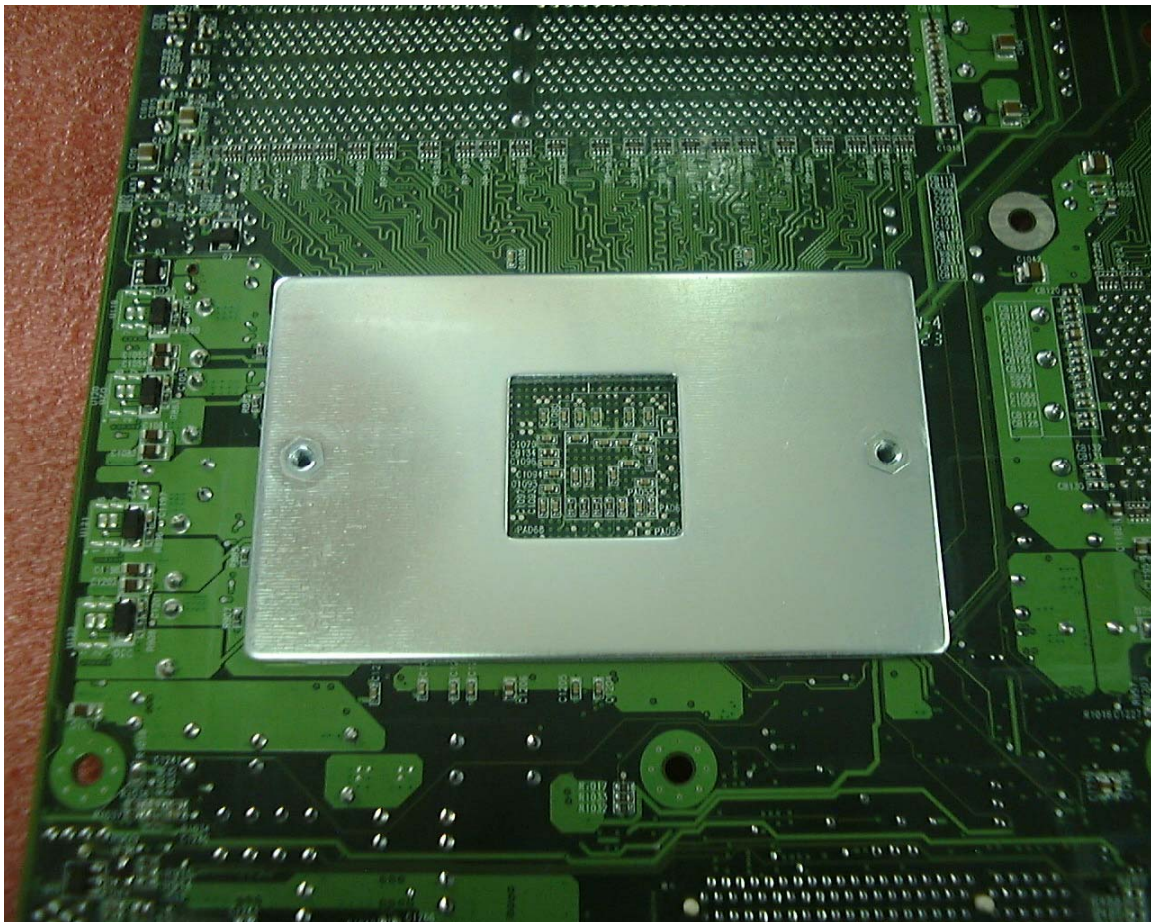


We discourage you from installing in the CPU2 socket if you have only one processor to install. The result may be unpredictable.

### Procedure:

First read the instructions that comes with the CPU

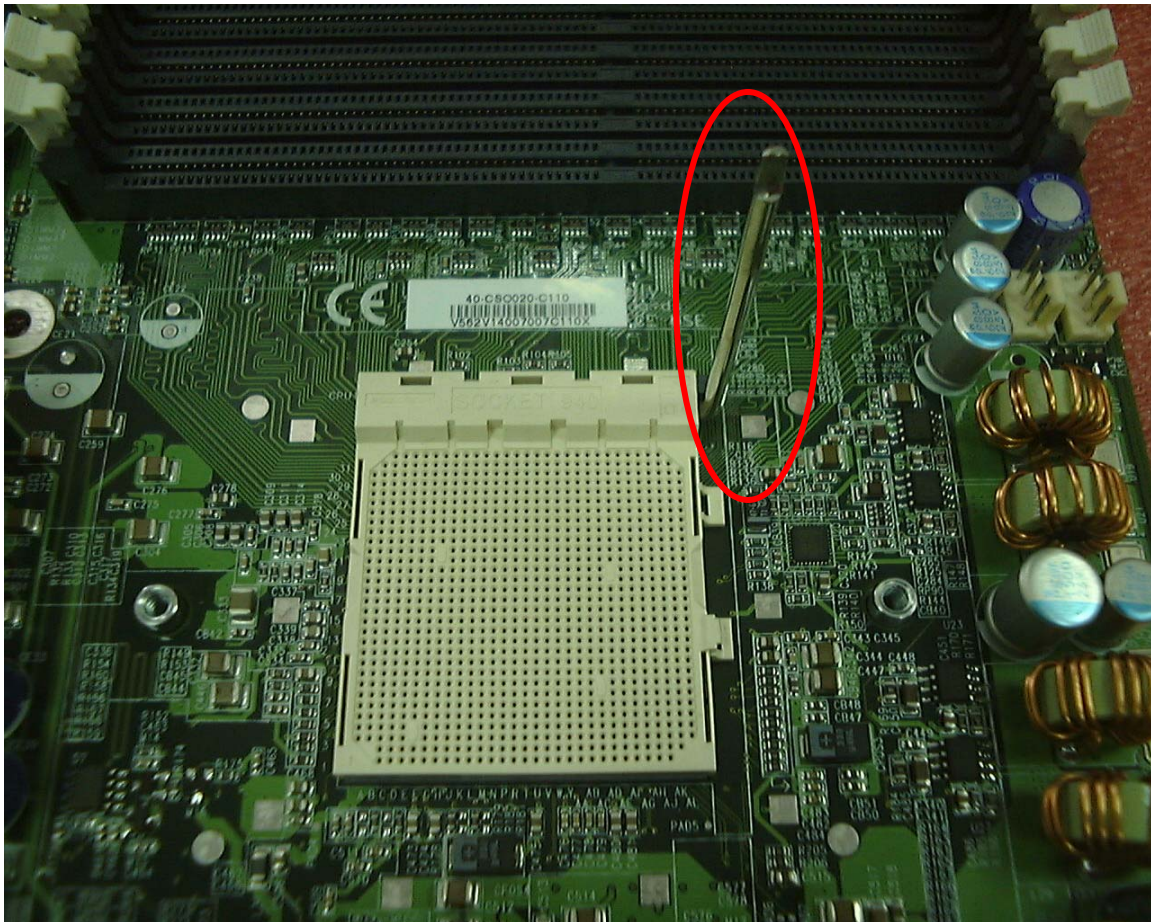
1. Flip over the motherboard and install the backplate. There are two holes around each CPU socket; align the backplate with the two holes around the CPU socket, insert the backplate from the back of the motherboard through the four holes. The backplate should now clamp onto the motherboard.





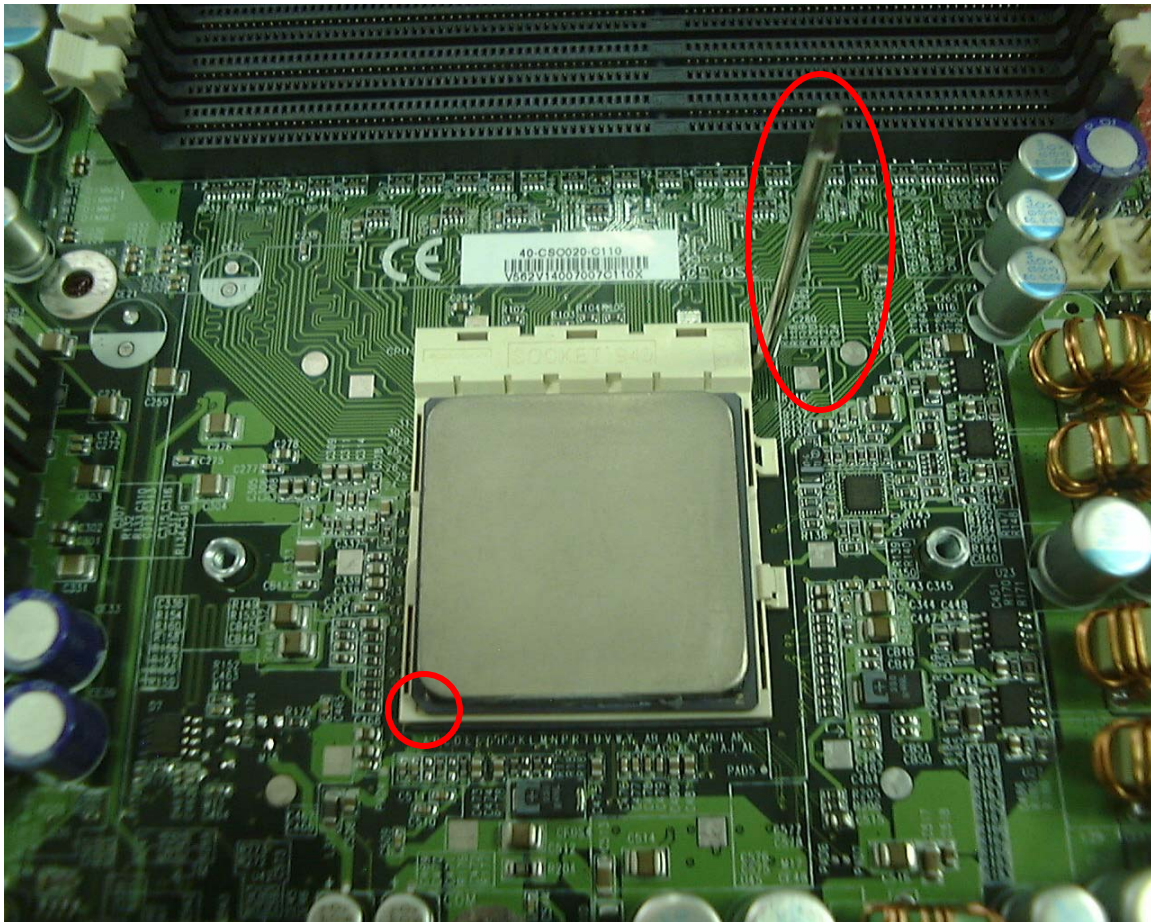
A good quality backplate should have tape over some parts of it that prevents electrical damage. Whenever possible, use high quality backplates to prolong the life of your motherboard.

2. Lift up the lever. Refer to the following picture.





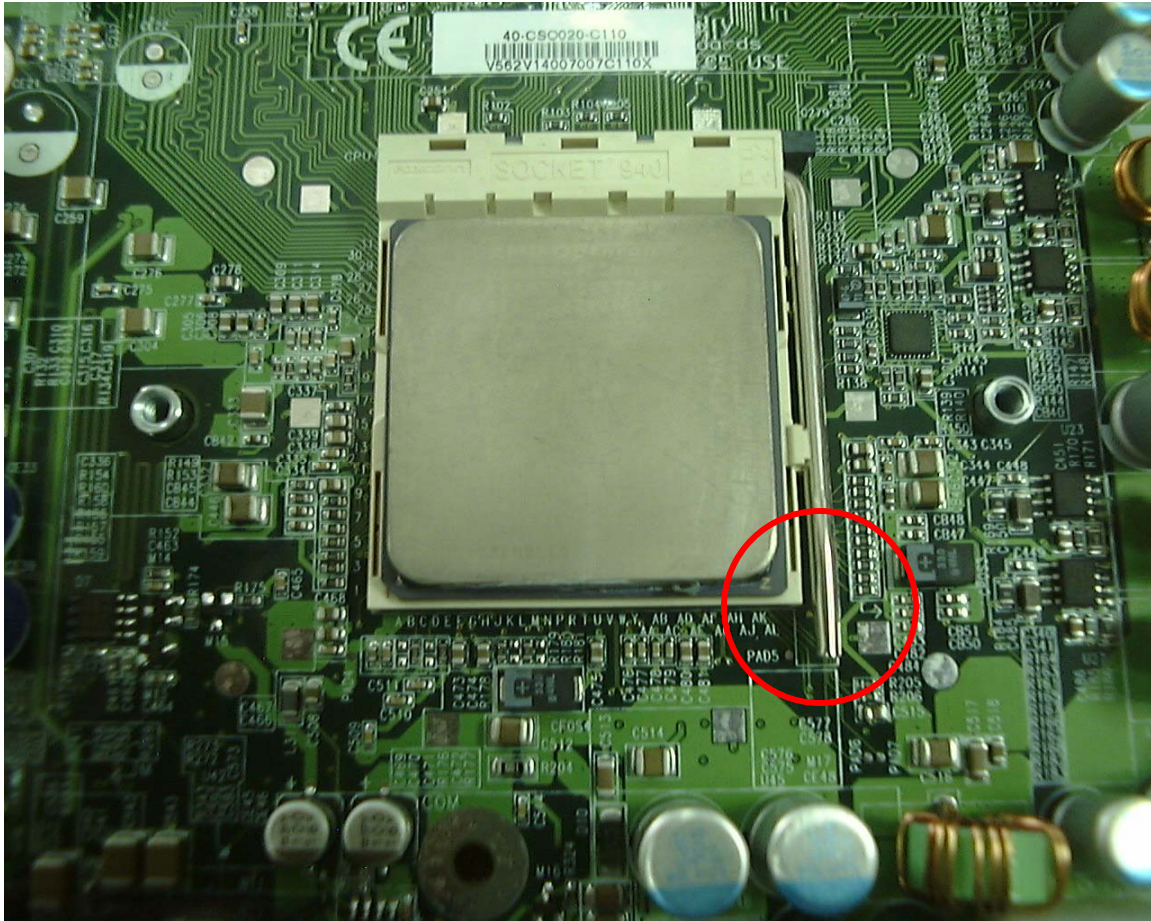
3. Place the CPU with the correct orientation (B) as shown in the following pictures. The lever is still up and the two triangles are in the same corner.



The CPU will not fit if the orientation is wrong. Do not try to force the CPU into the socket; it could result in irreparable damage to the CPU.



4. Lower the socket locking lever in place.

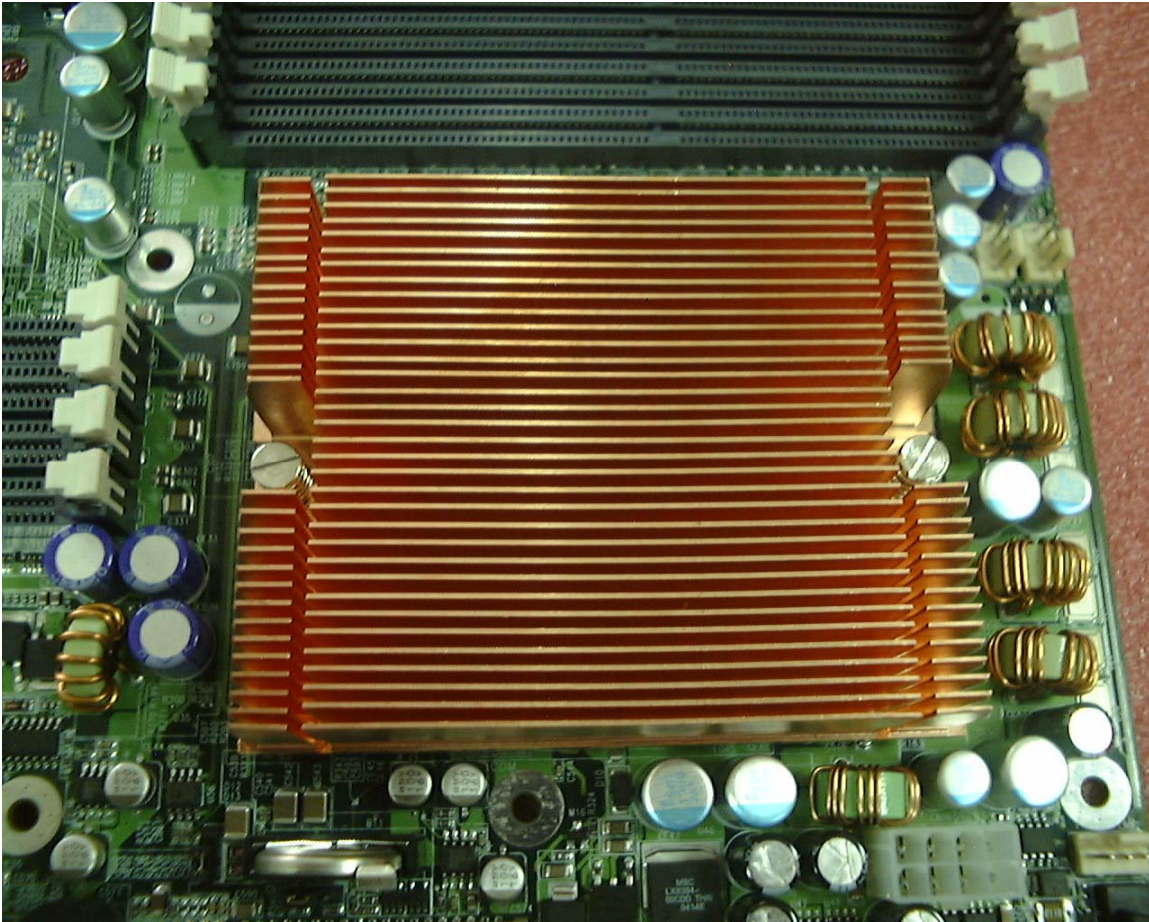


5. Now, rest the motherboard into the chassis, align the two holes of the backplate.



We do not recommend you to apply thermal grease at this point of the installation. The heatsink provided already has thermal grease on the bottom for your convenience. Do not apply more thermal grease if it is already present. Too much thermal grease will spill onto the CPU circuit and damage the CPU.

6. Mount the CPU heatsink to the top of the CPU and socket. Align the screws of the heatsink with the two holes of the backplate, then fasten them securely.



Repeat the steps for the installation of another CPU.

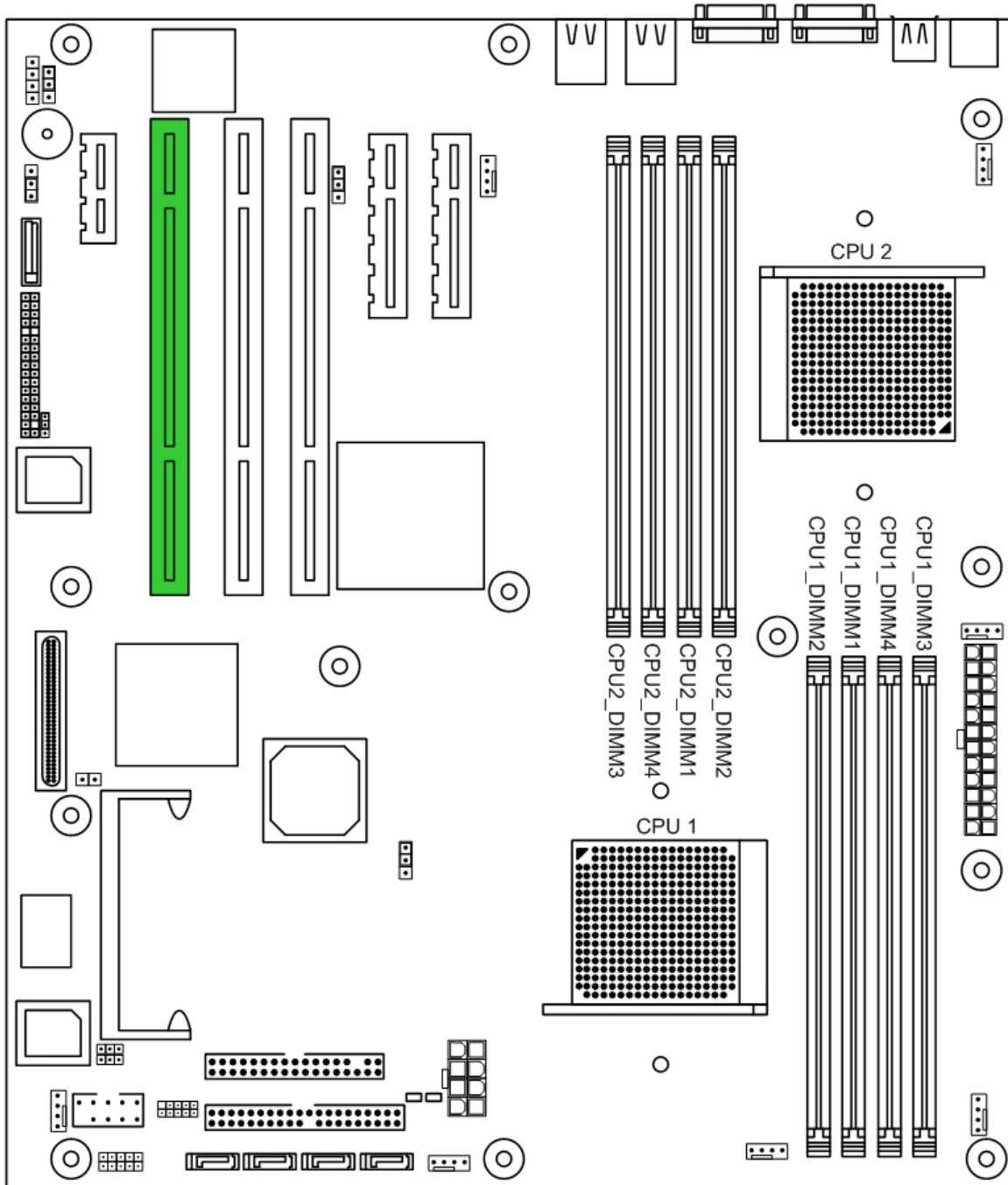


Heatsink not included in the package.

## 2.3 Installing the memory

### 2.3.1 DIMM combination

The following diagram indicates the locations of memory sockets.



Types of memory supported:

Eight sockets of 184-pin 2.6Volt DDR DIMM supporting DDR-400/333/266.



They are running on dual channel memory bus and two-way interleaved memory banks. Therefore, the memories must be INSTALLED IN MEMORY DIMM 1 AND 2, OR 3 AND 4. Be sure that every memory module is of the same speed, size and rank.

DDR memory types are determined by two factors: speed and rank. SW310 supports DDR 400/333/266 speed in both single/dual rank. The rank of your memory could impact the effectiveness of the motherboard. Besides DDR400 is supported by Opteron CPU rev. C0 and later.



The number of memory chips and how they are stacked on a memory module do not indicate the rank of that memory module. The only way to determine the rank of a memory module is to contact the memory manufacturer for its specification.

Table 1.

1 DIMM	H1 Bank: Slot 1 or Slot 3 (This only provides 64-bit memory access)	
2 DIMMs	H1 Bank: Slot 1, 2 or Slot 3, 4	
4 DIMMs	Single Processor	H1 Bank: Slot 1, 2, 3, 4 *
	Dual Processor	H1 Bank: Slot 1, 2 or Slot 3, 4 H2 Bank: Slot 1, 2 or Slot 3, 4
6 DIMMs	H1 Slot 1, 2, 3, 4 * H2 Slot 1, 2	
8 DIMMs	H1 Slot 1, 2, 3, 4 * H2 Slot 1, 2, 3, 4 *	

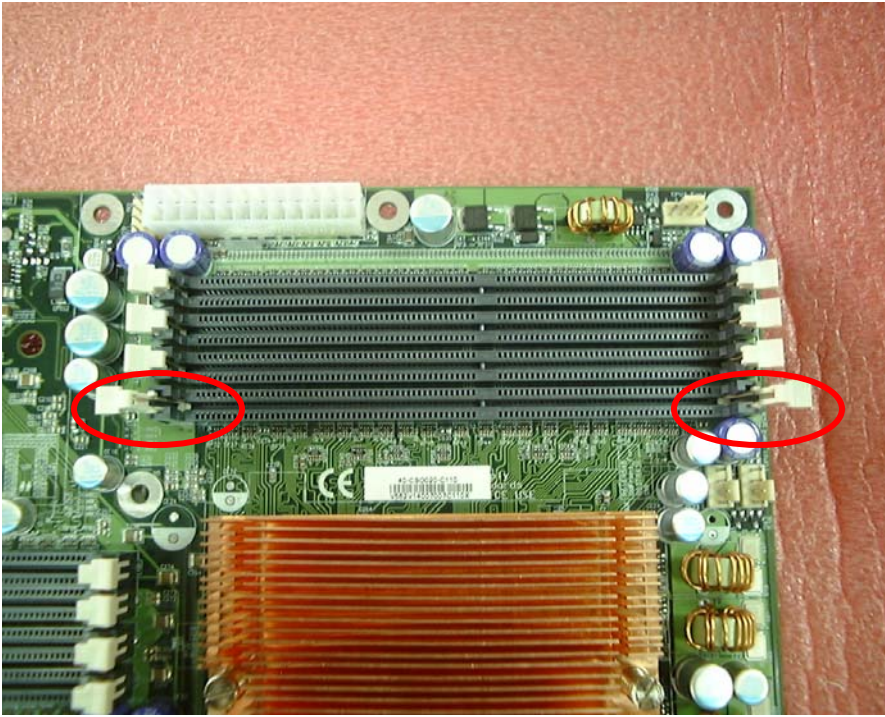
\*To support full speed of DDR400, please use [Single, Single, Single, Single] or [Double, Double, Single, Single] or [Single, Single, Double, Double].



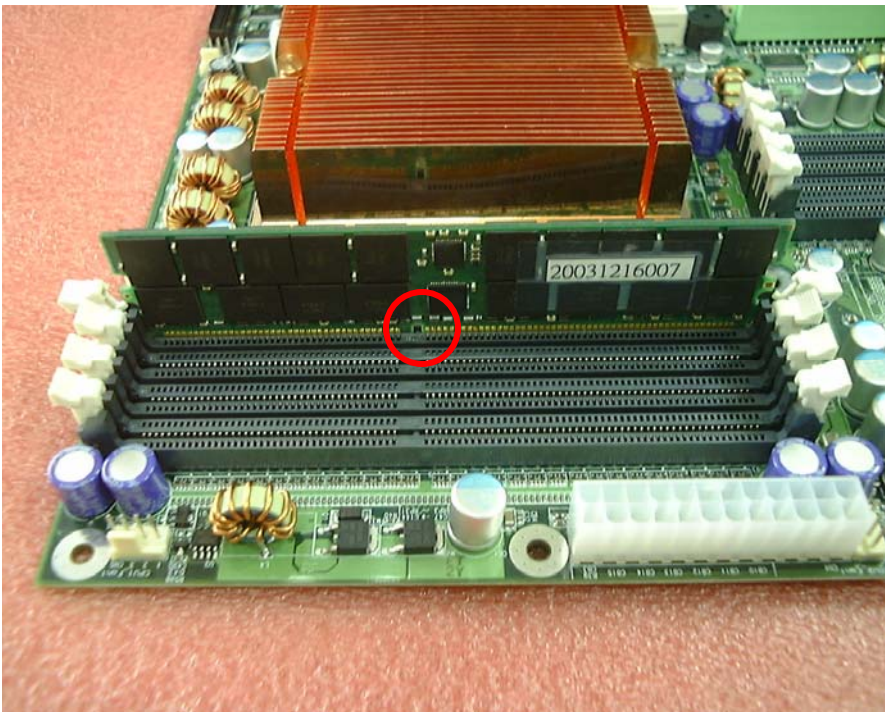
Any configuration other than the recommended is not guaranteed to work. Please refrain from using those configurations as we cannot provide technical support on them.

### 2.3.2 Installing DIMM modules

1. Open up the brackets:



2. Line up the memory with socket. Make sure the gap fits into the socket.



3. Push in the memory stick until bracket can be closed securely onto the stick. Make sure the brackets hold onto the memory module.



These pictures only show one memory stick but remember to install them in pairs.

## 2.4 Jumpers Configuration

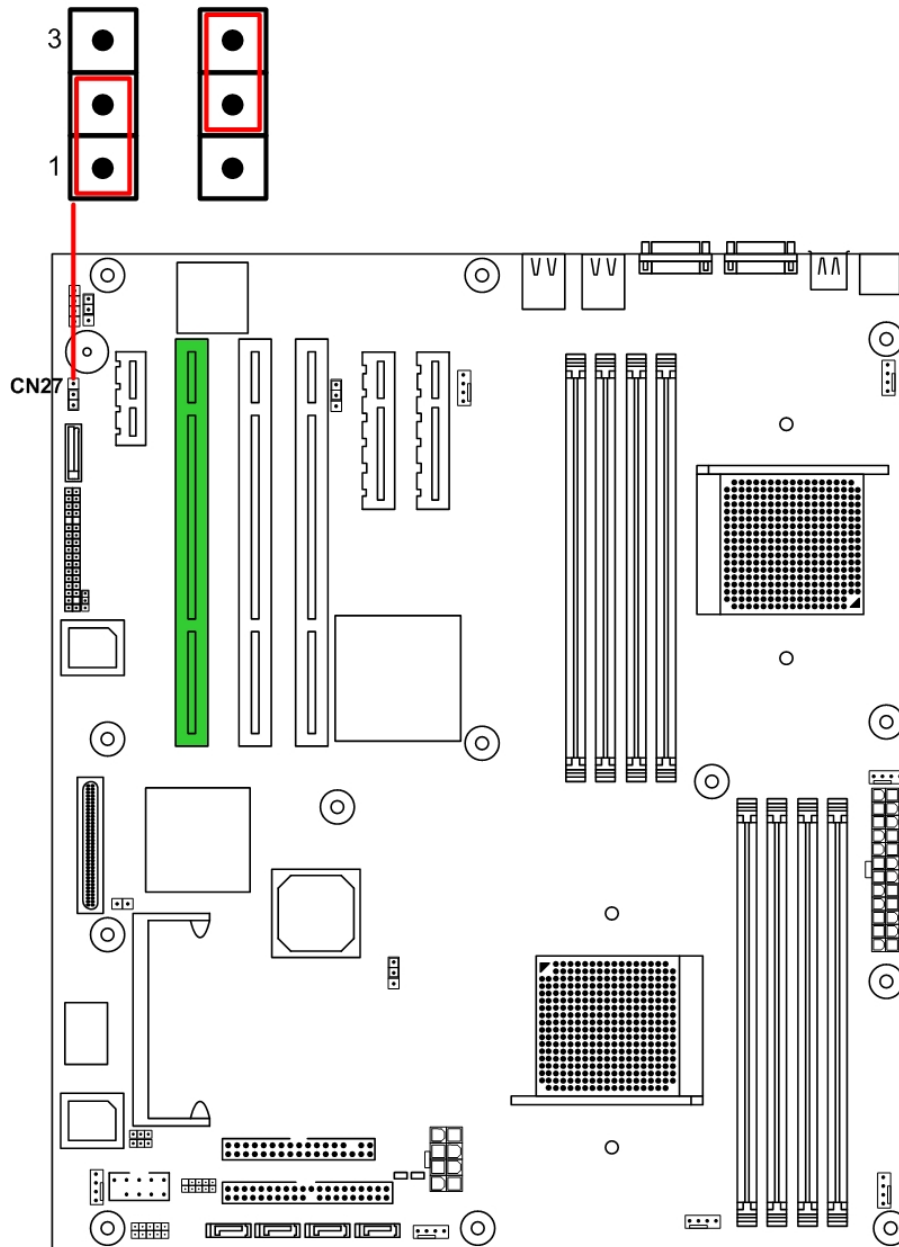
### 2.4.1 Clear CMOS header

Header CN27 controls CMOS setting. Position your motherboard as it appears in the following diagram.

To clear CMOS:

1. Turn off the system.
2. Short pin 2 and pin 3 using a jumper for a few seconds.
3. Take out the jumper.
4. Turn on the system and reconfigure the BIOS.

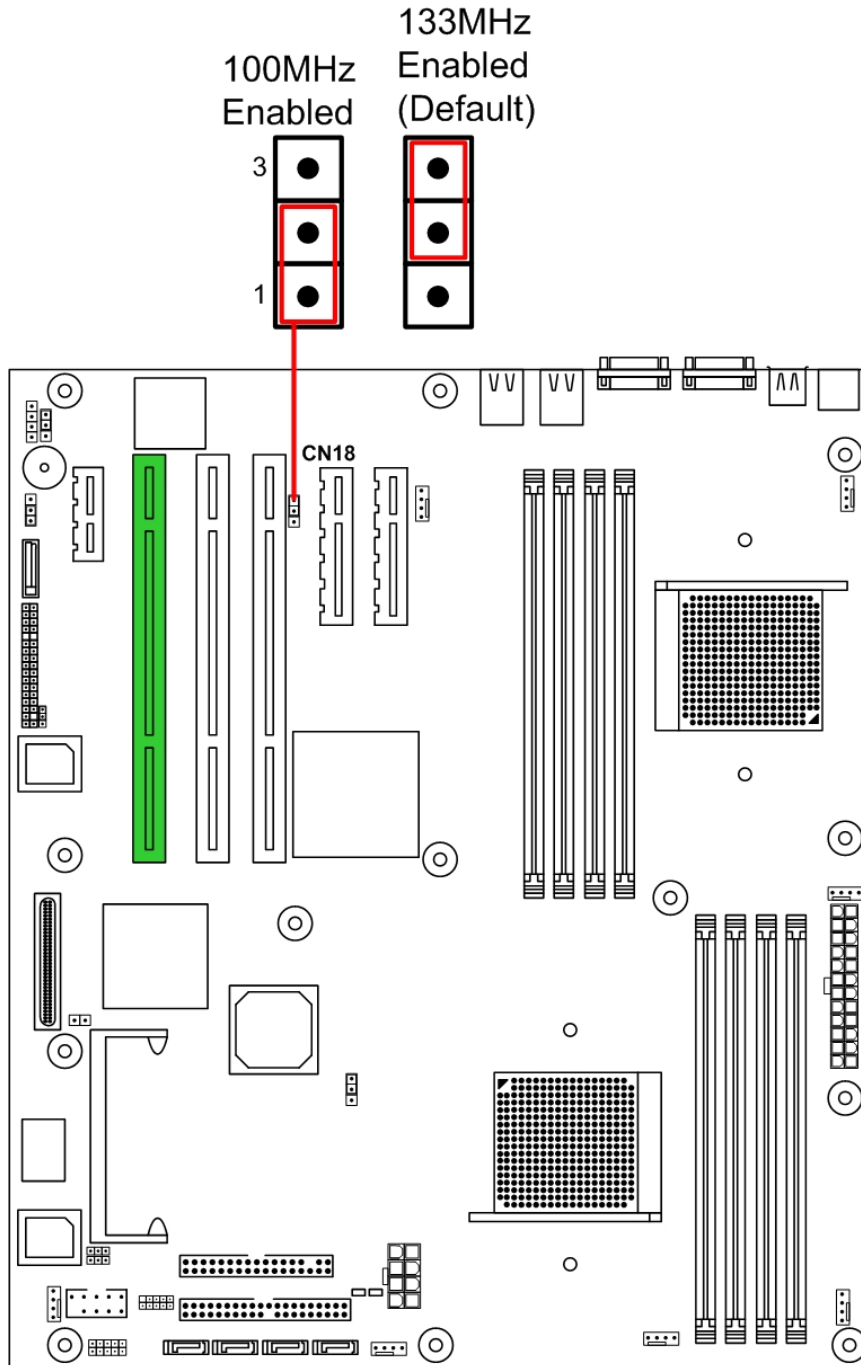
Normal    Clear  
(Default) CMOS





## 2.4.2 PCI-X Slot Clock Select Jumper

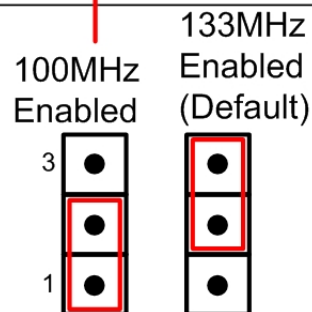
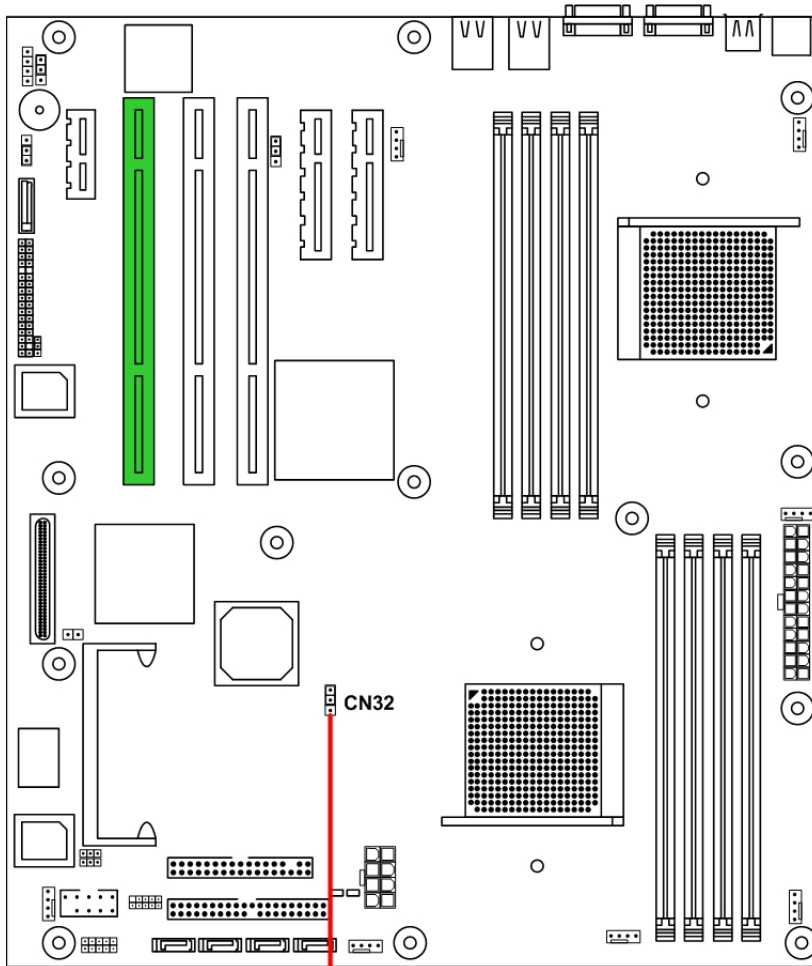
Header CN18 controls PCI-X Slot setting. When CN18 is 2-3 short, PCI-X slots are set to 133MHz. When CN18 is 1-2 short, PCI-X slot is set to 100MHz. The frequencies describe here are maximum operating frequencies. If PCI-X channel is shared with other devices, then maximum operating frequency cannot be achieved. Refer to the following diagram for the location of CN18.





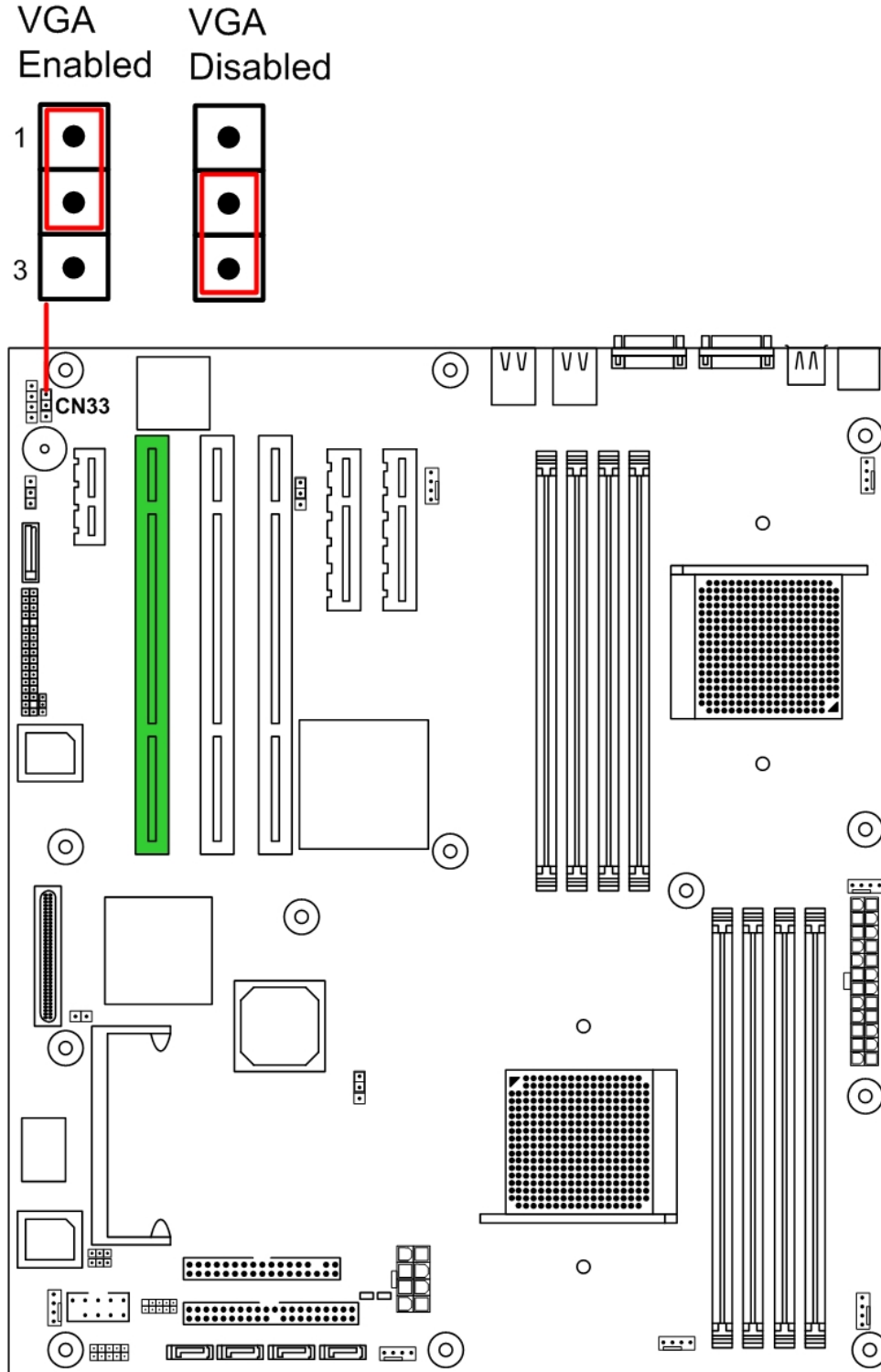
### 2.4.3 PCI-X-ZCR Slot Clock Select Jumper

Header CN32 controls PCI-X-ZCR Slot setting. When CN32 is 2-3 short, PCI-X slots are set to 133MHz. When CN32 is 1-2 short, PCI-X slot is set to 100MHz. The frequencies describe here are maximum operating frequencies. If PCI-X channel is shared with other devices, then maximum operating frequency cannot be achieved. Refer to the following diagram for the location of CN32.



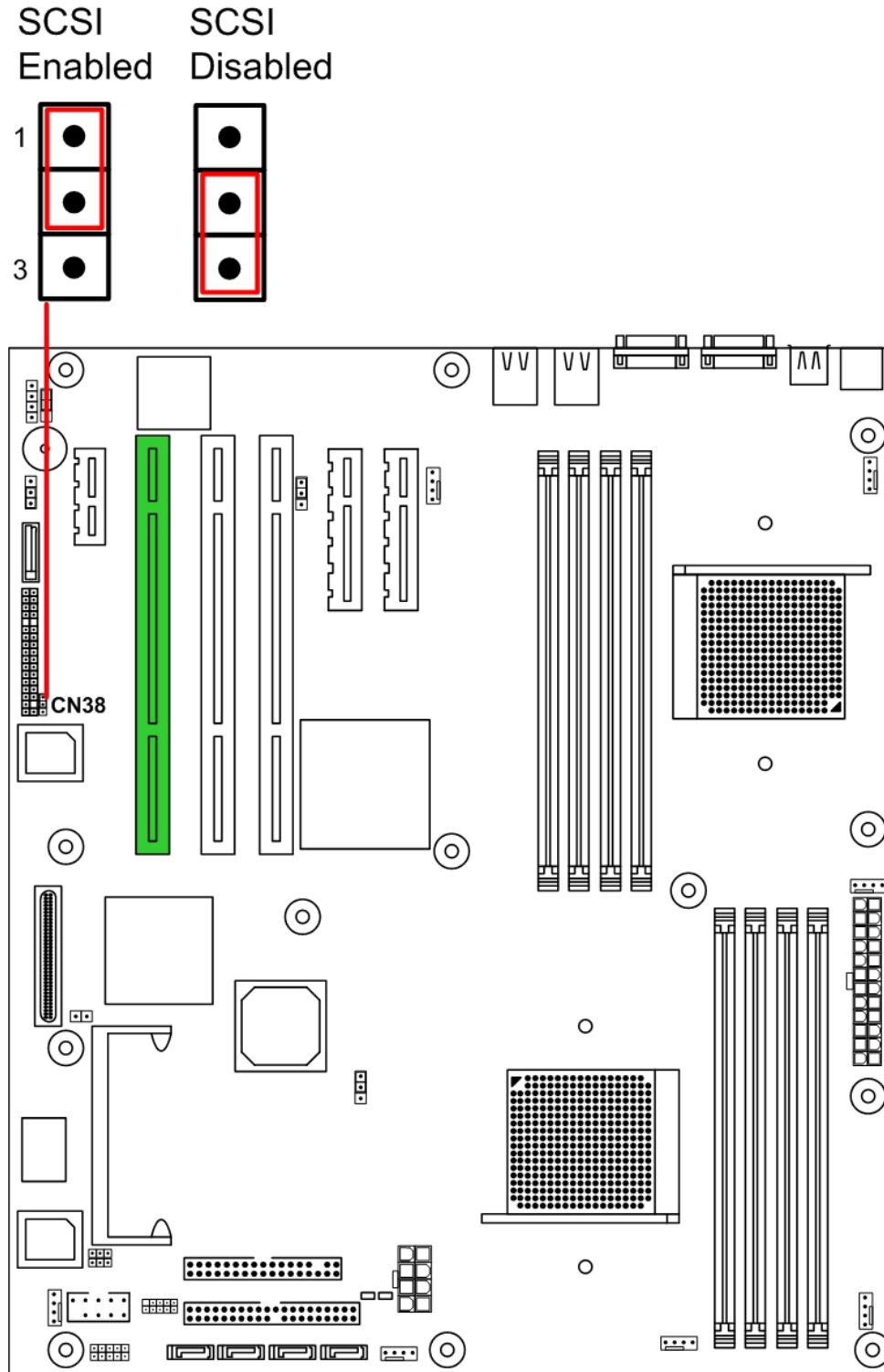
## 2.4.4 On-Board VGA Select Jumper Setting:

Header CN33 controls On-Board VGA setting. When CN33 is 1-2 short, On-Board VGA is enabled. When CN33 is 2-3 short, On-Board VGA is disabled. Refer to the following diagram for the location of CN33.



## 2.4.5 On-Board SCSI Select Jumper Setting:

Header CN38 controls On-Board SCSI setting. When CN38 is 1-2 short, On-Board SCSI is enabled. When CN38 is 2-3 short, On-Board SCSI is disabled. Refer to the following diagram for the location of CN38.



## 2.5 Power Supply

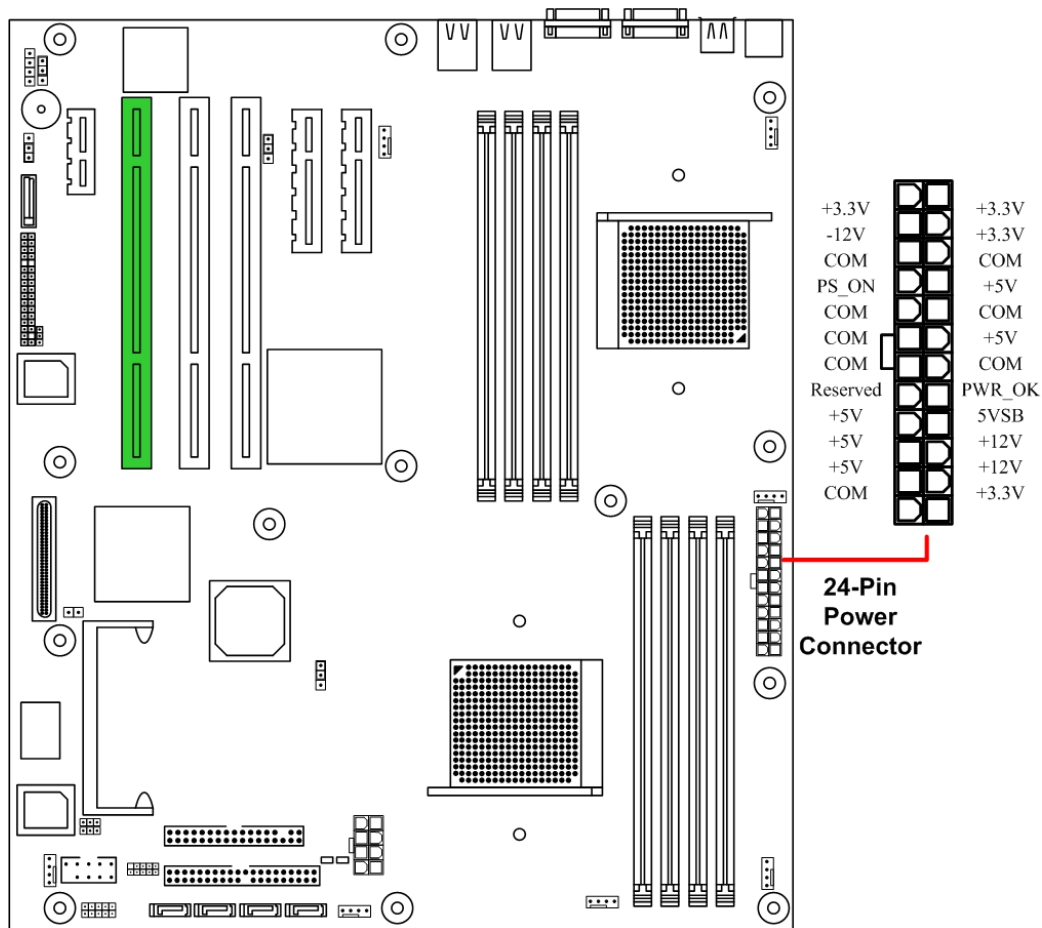
### 2.5.1 ATX 24-pin power connector

There are two 24 pin power connectors on the motherboard. Only one is needed to make the motherboard operational. The redundancy is built-in for your convenience; you may choose either one to hook up depending on the layout of your system chassis. The 24-pin connector provides power to the motherboard and the 8-pin connector provides power to the CPU. So both must be connected for the system to run properly.

Be sure to plug the power supply connector in the right direction. Failure to do so could cause damage to the motherboard.

Make sure your power supply can support at least 2 amps standby power for the Advanced Configuration and Power Interface (ACPI) functions.

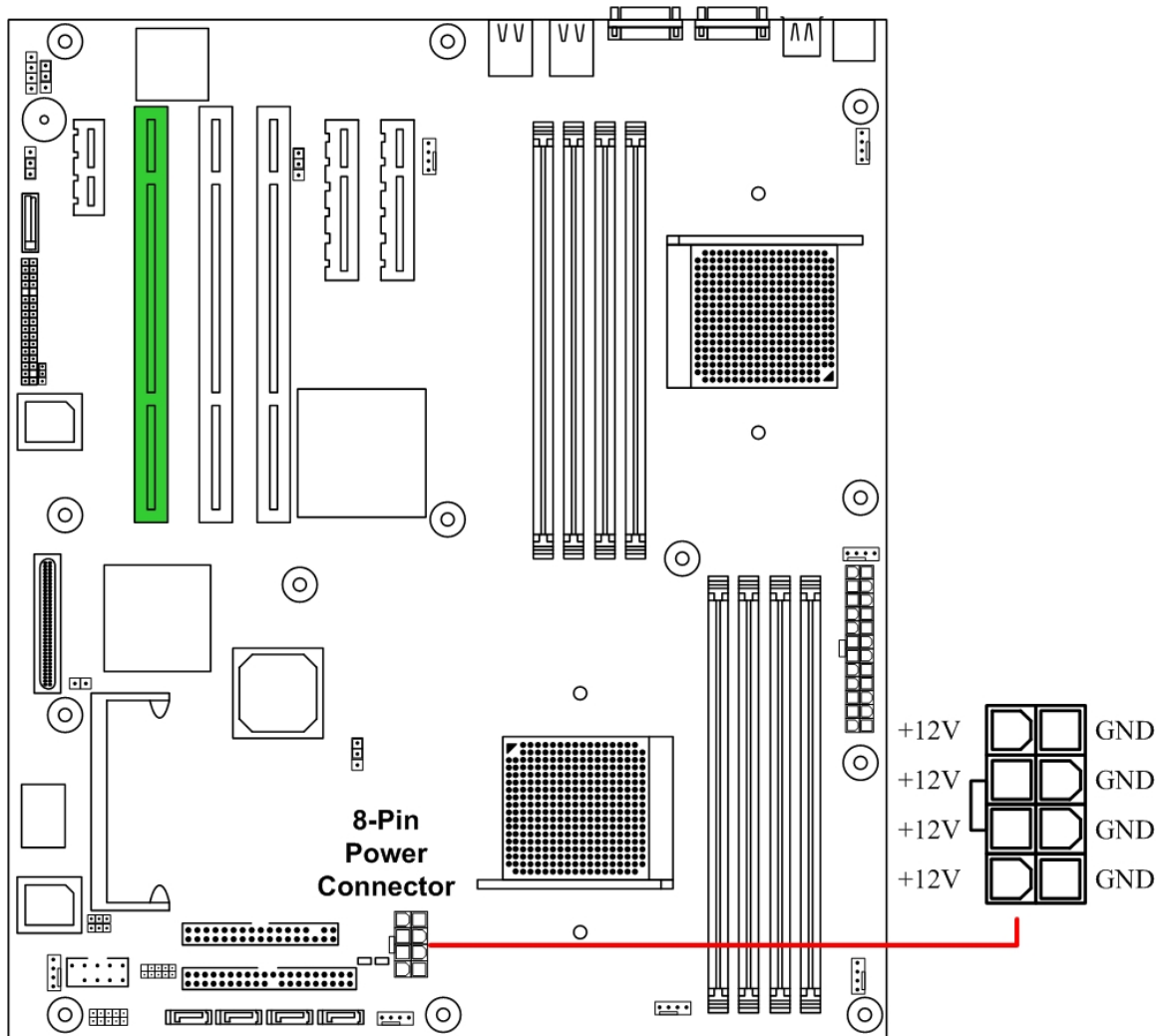
Refer to the following diagram for the connector locations and orientations.



Make sure the AC adapter is not plugged into the wall outlet during installation. The electric current could damage the motherboard.

## 2.5.2 ATX 8-pin power connector

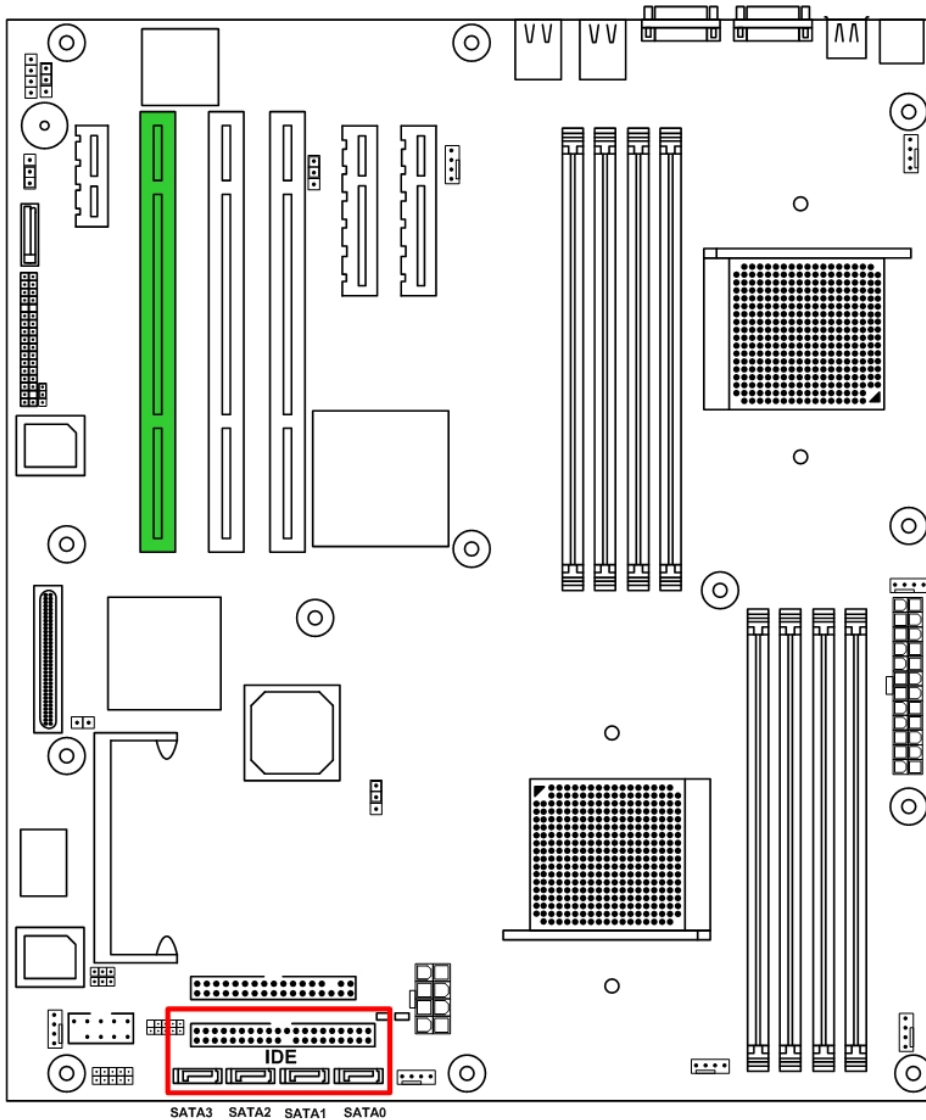
The 8-pin connector provides dedicated power to the CPU.  
Refer to the following diagram for its location and configuration.



## 2.6 Cables & Connectors

### 2.6.1 IDE and SATA connectors

The following diagram indicates the location of the IDE and SATA connectors:



As always, read the instructions that come with the IDE drive and then consult the instructions here.

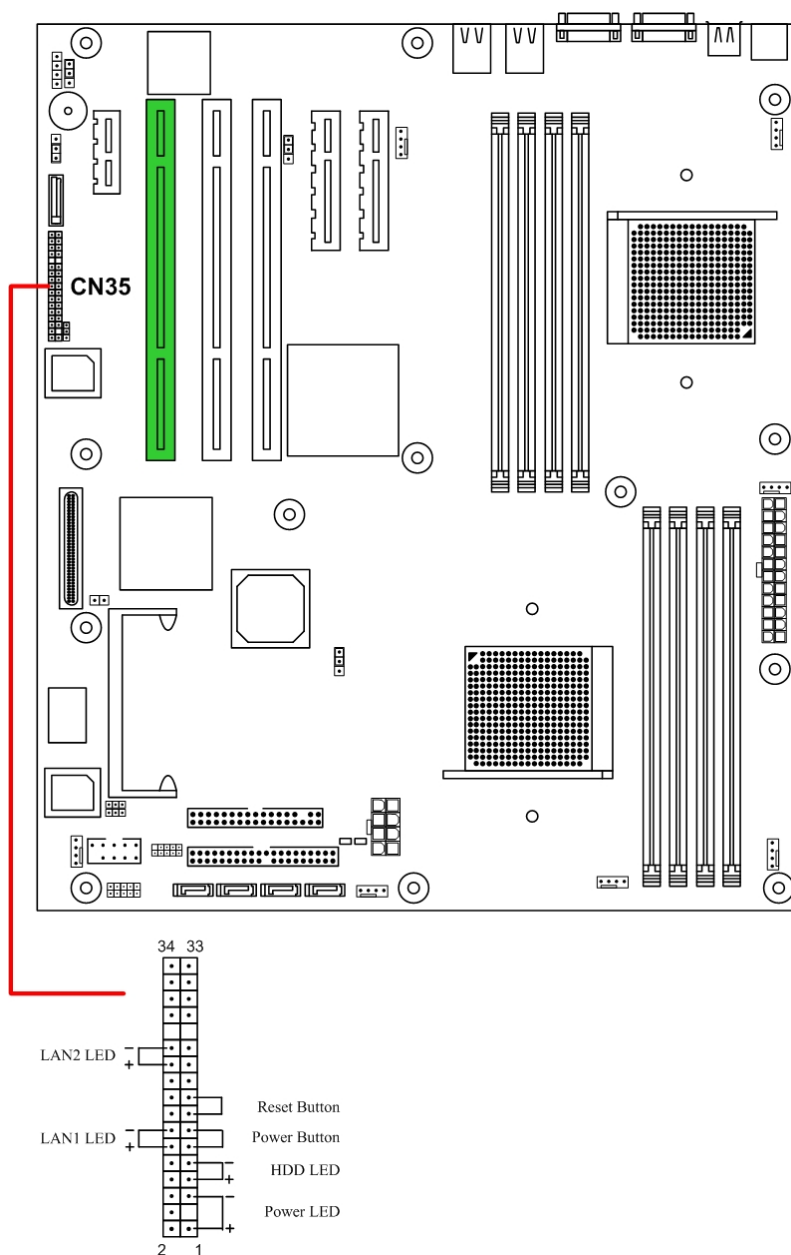
For Parallel ATA, installing IDE drives has become simpler over the years. The cables are now “keyed” to guide the user to the correct installation configuration. IDE connector can support two IDE drives.



Remember to set BIOS to match the configuration that you implement here. Go to Advanced Menu section of BIOS for detail.

## 2.6.2 Front Panel Connectors

You can find the pin number on the corner of the pin block. Pin 2 is located closer to the outer edge of the motherboard than pin 1. Pin 34 is closer to the outer edge of the motherboard than pin 33. The red + indicates the anode, or the +5V. The opposite pin, then, indicates the cathode or the ground.



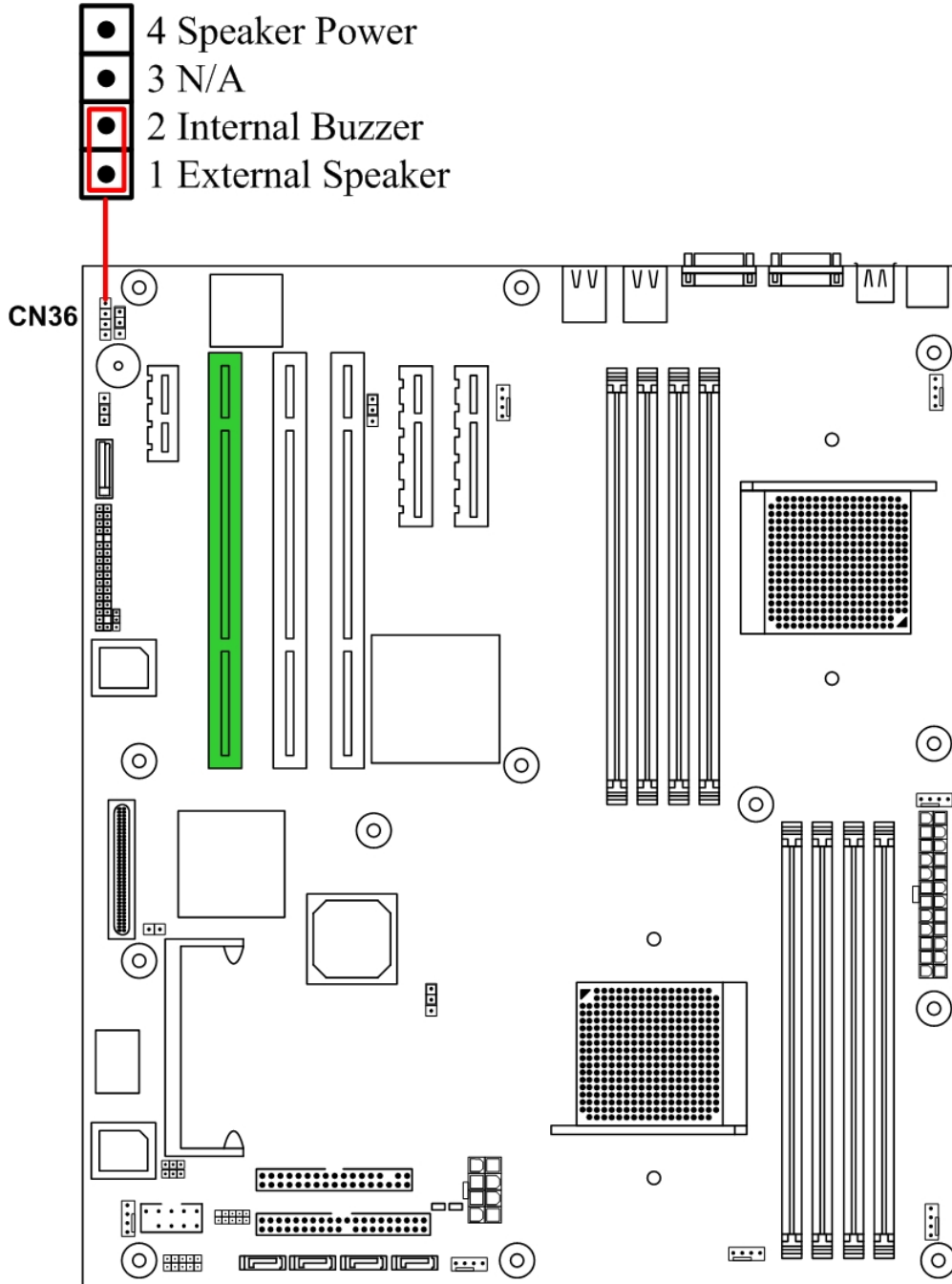
Power LED:	This 3-pin connector attaches to the power LED.
HDD Activity LED:	This 2-pin connector attaches to the LED of the hard disk. The LED lights up when HDD is active.
Power Switch:	This 2-pin connector attaches to the power button of the system.
Reset Switch:	This 2-pin connector attaches to the case-mounted reset switch for rebooting your computer without turning on/off your power switch.
LAN#1 Activity LED:	This connector connects to the LED that lights up when there is activity on the LAN 1 port.
LAN#2 Activity LED:	This connector connects to the LED that lights up when there is activity on the LAN 2 port.

# Pin-27 to Pin-34 are reserved for OEM purpose



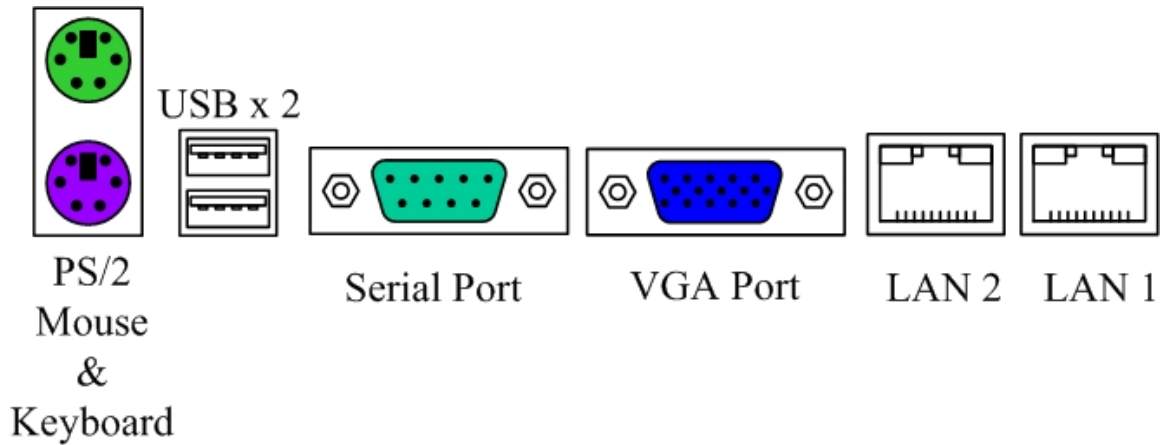
### 2.6.3 Speaker Connectors

You can find the pin number on the corner of the pin block. When CN36 is 1-2 short, Internal Buzzer is enabled. Refer to the following diagram for the location of CN36.



## 2.6.4 Rear Panel I/O ports

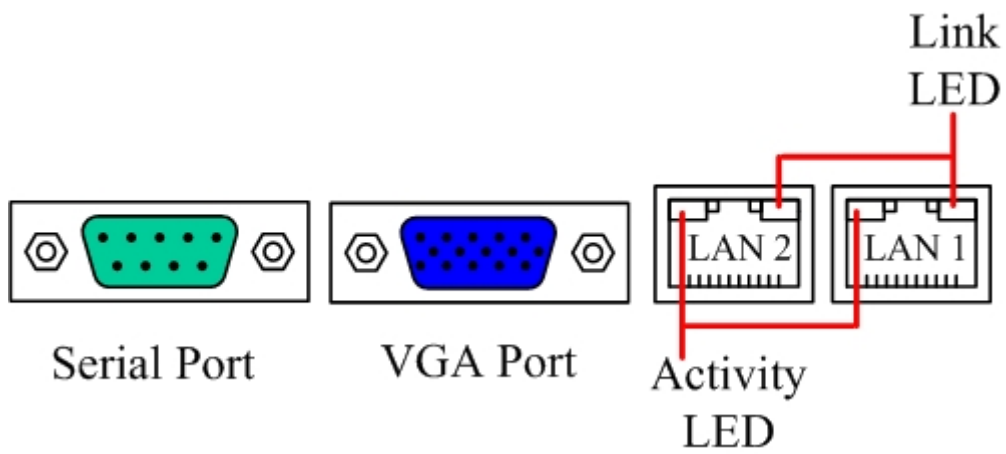
The following illustration displays the motherboard I/O port array.



Type of Port	Function
PS/2 Mouse connector	The system will direct IRQ12 to the PS/2 mouse if one is detected. If not detected, IRQ12 can be used for expansion slot.
PS/2 Keyboard connector	This connection is for a standard keyboard using a PS/2 plug (mini DIN). This connector will not allow standard AT size (large DIN) keyboard plugs. You may use a DIN to mini DIN adapter on standard AT keyboards.
USB Port 1 & 2	Two external USB 2.0 ports that allow simultaneous connections of 2 USB devices.
Serial Port connector (9-pin male)	This serial port can be used for pointing devices or other serial devices. See BIOS setup.
VGA connector (15-pin female)	The VGA port connects display devices such as a monitor. See the BIOS setup.
Gigabit Ethernet Port 1 & 2	These ports are RJ-45. The motherboard uses Broadcom 57xx dual channel Gigabit Ethernet Controller, depending on the manufacturing option.

## 2.6.5 Back Panel LAN LED

Indication	Meaning
LED off	No link
Left LED Green	Active
Right LED Green	Link

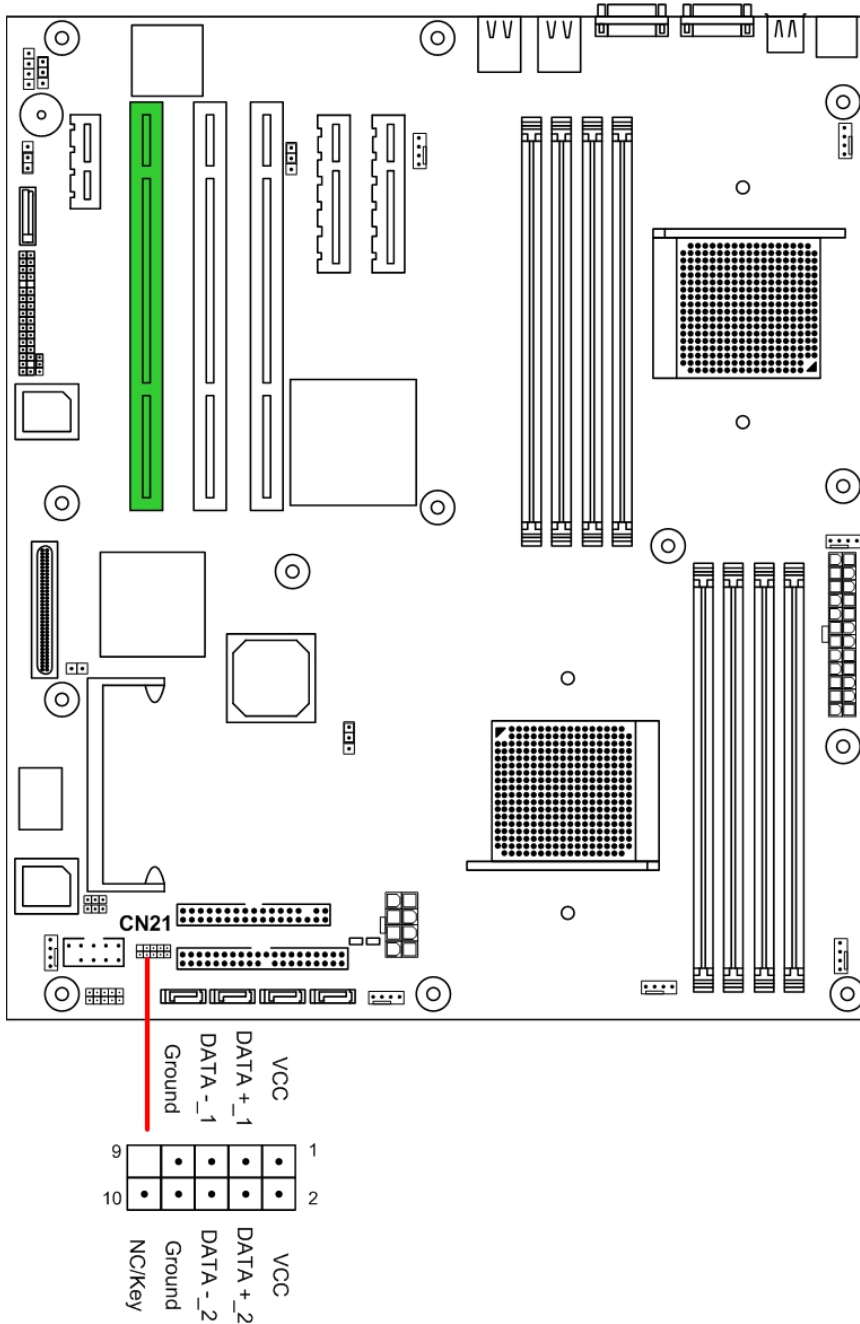


## 2.6.6 Front USB Connector

Header CN21 controls the two front USB connections.

To activate the front USB, connect the two USB wire to CN21. Each USB wire requires 4 pins; CN21 has 9 pins, therefore supports two USB connections. The one extra pin is for chassis ground use.

Refer to the following diagram for the location of CN21.



## CHAPTER 3. BIOS SETUP

This chapter discusses the PhoenixBIOS setup program built into the ROM BIOS.

BIOS is the basic input/output system, the firmware on the motherboard that enables the hardware to interface with the software. The setup program allows the users to modify the basic system configurations according to their needs. The configuration is then stored in battery-backed NVRAM so that it retains the configuration when the power is turned off. The PhoenixBIOS installed in the motherboard's ROM is a custom version of an industry standard BIOS.

The rest of the chapter will list all the menus and sub-menus in the BIOS. Along with them, you can also find the list of possible values for any configurable item in the BIOS.

### 3.1 ENTERING BIOS SETUP

The PhoenixBIOS is activated when the system powers on. The BIOS reads the system information contained in the CMOS and begins the process of checking out the system and configuring it. After finishing configuring the whole system, BIOS will seek an OS on disk and turn over control of the system to the OS found.

While BIOS is in control, the Setup menu can be accessed by pressing the <F2> key when the following message appears briefly at the bottom of the screen during Power On Self Test: "Press <F2> to enter SETUP."

## 3.2 Using Setup

The following table provides details about how to navigate the Setup program using keyboard.

KEY	FUNCTION
Up Arrow ↑	Move to the previous item.
Down Arrow ↓	Move to the next item.
Left Arrow ←	Move to the previous menu.
Right Arrow →	Move to the next menu.
Esc	In the submenu: Exit the submenu. In the main menu: Exit without saving.
Enter	Select the item. A pop-up window will appear to allow setting of the item's value. If the item has a 4in front of it, it means that the item leads to a sub-menu. Pressing <Enter> will take you to the sub-menu.
PgUp	Increase the numeric value or goes to the previous setting value.
PgDn	Decrease the numeric value or goes to the next setting value.
+	Increase the numeric value or goes to the previous setting value.
-	Decrease the numeric value or goes to the next setting value.
F1	General help on setup navigation keys. Press <F1> key to pop up a small help window that describe the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <ESC> key or <F1> key again.
F9	Setup Defaults.
F10	Save and Exit.

### 3.3 Troubleshooting

In case the system cannot be booted after some changes in BIOS, use the clear CMOS jumper setting to reset the BIOS to default. To avoid such problem, configure only the items that you thoroughly understand and refrain from modifying the default chipset settings.

### 3.4 Main Menu:

PhoenixBIOS Setup Utility						
<b>Main</b>	Advanced	Security	Power	Boot	Server	Exit
						Item Specific Help
System Time [12:59:59] System Date [07/26/2005]  BIOS Version V1.00 Legacy Diskette A: [1.44/1.25 MB 3½]  System Memory: 608 KB Extended Memory: 4030KB						<Tab>, <Shift-Tab>, or <Enter> selects field.
F1 Help    ↑↓ Select Item    +/- Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit						

The following table shows the items that you can customize on the Main menu page:

Item	Options	Description
System Time	No options.	Shows the time of the day in the format of Hour/Min/Sec.
System Date	No options.	Shows the date in the format of MM/DD/YYYY.
Legacy Diskette A	Disabled 360 Kb 1.2 MB 720 Kb 1.44/1.25 MB 2.88 MB	Selects floppy type. Note that 1.25 MB 3½" references a 1024 byte/sector Japanese media format. The 1.25 MB, 3½" diskette requires a 3-Mode floppy-disk drive.
System Memory	No options.	This item is not configurable to user.
Extended Memory	No options.	This item is not configurable to user.



### 3.5 Advanced Menu:

PhoenixBIOS Setup Utility						
Main	<b>Advanced</b>	Security	Power	Boot	Server	Exit
						Item Specific Help
Reset Configuration Data: [NO] QuickBoot Mode: [Disabled] Boot-Time Diagnostic: [Disabled]  ► Chipset Feature ► Disk Configurations ► Integrated Peripherals ► Console Redirection						Select 'Yes' if you want to clear the extended system configuration data (ESCD) area.
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit						

The following table shows the items that you can customize on the Advanced menu page:

Item	Options	Description
Reset Configuration Data	No Yes	Select 'Yes' if you want to clear the extended system configuration data (ESCD) area.
QuickBoot Mode	Disabled Enabled	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Boot-Time Diagnostic Screen	Disabled Enabled	Display the diagnostic screen during boot.

### 3.5.1 Chipset Feature Sub Menu

The Chipset Feature Sub Menu looks like the following:

PhoenixBIOS Setup Utility		
<b>Advanced</b>		
Chipset Feature		Item Specific Help
ACPI SRAT Table [Enabled] Memory Frequency Downgrade [AUTO] Memhole mapping [Hardware] Dram Bank Interleave [Disabled] Node Memory Interleave [Disabled]		Enable ACPI 2.0 static resources affinity table for ccNUMA system NOTE: This cannot be enabled if node interleave is also enabled. Table will not be created if node interleave is enabled
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit		

The following table shows the items that you can customize on the Chipset Feature sub-menu page:

Item	Options	Description
ACPI SRAT Table	Disabled Enabled	Enable ACPI 2.0 static resources affinity table for ccNUMA system NOTE: This cannot be enabled if node interleave is also enabled. Table will not be created if node interleave is enabled
Memory Frequency Downgrade	AUTO DDR266 DDR333 DDR400	Memory Frequency Downgrade AUTO: Follow AMD spec. to downgrade MAX memory frequency. DDR266: Downgrade MAX. frequency to 266MHz. DDR333: Downgrade MAX. frequency to 333MHz. DDR400: Force MAX. frequency as 400MHz.
Memhole mapping	Disabled Software Hardware	Remapping scheme for PCI memory hole.
Dram Bank Interleave	Disabled Enabled	Interleave memory blocks across dram chip select. BIOS will auto detect capability on each Node.
Node Memory Interleave	Disabled Enabled	Interleave memory blocks across Processor Nodes. BIOS will auto detect capability of Memory System.

### 3.5.2 Disk Configurations Sub Menu

The Disk Configurations Sub Menu looks like the following:

PhoenixBIOS Setup Utility		
<b>Advanced</b>		
Disk Configurations		Item Specific Help
Embedded SATA	[Enabled]	Embedded SATA enable or disable.
SATA mode	[PATA]	
► Primary Master	[120GB]	
► Primary Slave	[None]	
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit		

The following table shows the items that you can customize on the Disk Configuration sub-menu page:

Item	Options	Description
Embedded SATA	Disabled Enabled	Embedded SATA enable or disable.
SATA mode	PATA SATA	PATA – Parallel ATA emulation mode SATA – Native SATA mode

### 3.5.2.1 Primary Master/Slave Sub Menu

The Primary Master/Slave Sub Menu looks like the following:

PhoenixBIOS Setup Utility		
<b>Advanced</b>		
Primary Master [120GB]		Item Specific Help
Type:	[Enabled]	User = you enter parameters of hard-disk drive installed at this connection.  Auto = autotypes hard-disk drive installed here.  1-39 = you select pre-determined type of hard-disk drive installed here.  CD-ROM = a CD-ROM drive is installed here.  ATAPI Removable = removable disk drive is installed here.
Multi-Sector Transfers:	[16 Sectors]	
LBA Mode Control:	[Enabled]	
32 Bit I/O:	[Disabled]	
Transfer Mode:	[Fast PIO 4]	
Ultra DMA Mode:	[Mode 5]	
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit		

The following table shows the items that you can customize on the Primary Master/Slave sub-menu page:

Item	Options	Description
Type	Auto None CD-ROM ATAPI Removable IDE Removable Other ATAPI User	User = you enter parameters of hard-disk drive installed at this connection.  Auto = autotypes hard-disk drive installed here.  1-39 = you select pre-determined type of hard-disk drive installed here.  CD-ROM = a CD-ROM drive is installed here.  ATAPI Removable = removable disk drive is installed here.
Multi-Sector Transfers	Disabled 2 Sectors 4 Sectors 8 Sectors 16 Sectors	Specify the number of sectors per block for multiple sector transfers. "MAX" refers to the size the disk returns when queried.
LBA Mode Control	Disabled Enabled	Enabling LBA causes Logical Block Addressing to be used in place of Cylinders, Heads_Sectors.

32 Bit I/O	Disabled Enabled	This setting enables or disables 32 bit IDE data transfers.
Transfer Mode	Standard Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3 / DMA 1 FPIO 4 / DMA 2	Select the method for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.
Ultra DMA Mode	Disabled Mode 1 Mode 2 Mode 3 Mode 4 Mode 5	Select the Ultra DMA mode used for moving data to/from the drive. Autotype the drive to select the optimum transfer mode.

### 3.5.3 Integrated Peripherals Sub Menu

The Integrated Peripherals Sub Menu looks like the following:

PhoenixBIOS Setup Utility		
<b>Advanced</b>		
Integrated Peripherals		Item Specific Help
► Keyboard Configuration Legacy USB Support: [Enabled] Floppy disk controller: [Enabled]  Serial port A: [Enabled] Base I/O address: [3F8/IRQ 4] Serial port B: [Enabled] Base I/O address: [2F8/IRQ 3]  Onboard SCSI (LSI53C1020A) [Enabled] Onboard GLAN OPRON Scan: [Enabled]		Enables 2 <sup>nd</sup> Logical Processor.  This is applicable only for Hyper-Threading supported Operating System.  Check with OS vendor for detail.
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit		

The following table shows the items that you can customize on the Integrated Peripherals sub-menu page:

Item	Options	Description
Legacy USB Support	Disabled Enabled	Enable or Disable support for USB Keyboard and Mice. (Enable for use with a non-USB aware Operating System such as DOS or UNIX)
Floppy disk controller	Disabled Enabled Auto	Enable or disable onboard legacy floppy diskette controller.  NOTE: If disable is chosen please set main menu legacy diskettes to disabled. If not done and an add-in removable device is used, it will not be assigned drive number 0 (or a:)
Serial port A/B	Disabled Enabled Auto	Configure serial port A/B using options:  [Disabled] No Configuration  [Enabled] User configuration  [Auto] BIOS or OS chooses configuration

Base I/O address	3F8/IRQ 4 2F8/IRQ 3 3E8/IRQ 4 2E8/IRQ 3	Set the base I/O address for serial port A/B.
Onboard SCSI (LSI53C1020A)	Enabled Disabled	Enable / Disable onboard SCSI device
Onboard GLAN OPROM Scan	Enabled Disabled	Enabled/Disabled Onboard GLAN OPROM scan

### 3.5.3.1 Keyboard Configuration Sub Menu

The Keyboard Configuration Sub Menu looks like the following:

<b>Advanced</b>		PhoenixBIOS Setup Utility	
Keyboard Configuration			Item Specific Help
NumLock: [On] Keyboard auto-repeat rate: [30/sec] Keyboard auto-repeat delay: [1/4 sec]			Selects Power-on state for Numlock
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit			

The following table shows the items that you can customize on the Keyboard Configuration sub-menu page:

Item	Options	Description
Numlock	On Off	Selects Power-on state for Numlock
Keyboard auto-repeat rate	30/sec 26.7/sec 21.8/sec 18.5/sec 13.3/sec 10/sec 6/sec 2/sec	Selects key repeat rate
Keyboard auto-repeat delay	1/4 sec 1/2 sec 3/4 sec 1 sec	Selects delay before key repeat



### 3.5.4 Console Redirection Sub Menu

The Console Redirection Sub Menu looks like the following:

PhoenixBIOS Setup Utility		
<b>Advanced</b>		
Console Redirection		Item Specific Help
Com Port Address	[Disabled]	If enabled, it will use a port on the motherboard.
Baud Rate	[57.6K]	
Console Type	[ANSI]	
Flow Control	[None]	
Console connection	[Direct]	
Continue C.R. after POST	[Off]	
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit		

The following table shows the items that you can customize on the Console Redirection sub-menu page:

Item	Options	Description
Com Port Address	Disabled On-board COM A On-board COM B	If enabled, it will use a port on the motherboard.
Baud Rate	300 1200 2400 9600 19.2K 38.4K 57.6K	Enables the specified baud rate.
Console Type	VT100 VT100, 8bit ANSI, 7bit ANSI VT100+ UTF8	Enables the specified console type.
Flow Control	None XON/XOFF CTS/RTS	Enables flow control
Console connection	Direct Via modem	Indicate whether the console is connected directly to the system or a modem is used to connect.
Continue C.R. after POST	Off On	Enables Console Redirection after OS has loaded.

### 3.6 Security Menu:

PhoenixBIOS Setup Utility							
Main	Advanced	<b>Security</b>	Power	Boot	Server	Exit	
							Item Specific Help
Supervisor Password Is:      Clear User Password Is:              Clear  Set Supervisor Password:      [Enter] Set User Password:              [Enter]							Supervisor Password controls access to the setup utility.
F1 Help      ↑↓ Select Item      -/+ Change Values      F9 Setup Defaults ESC Exit      ←→ Select Menu      Enter Select ► Sub-Menu      F10 Save and Exit							

The following table shows the items that you can customize on the Security menu page:

Item	Options	Description
Supervisor Password Is	Clear Set	Displays the password if there is one.
User Password Is	Clear Set	Displays the password if there is one.
Set Supervisor Password	Enter	Supervisor Password controls access to the setup utility.
Set User Password	Enter	*Note: to use this feature, you must first set supervisor password.

### 3.7 Power Menu:

PhoenixBIOS Setup Utility						
Main	Advanced	Security	<b>Power</b>	Boot	Server	Exit
						Item Specific Help
WakeUp On LAN [Disabled]  Resume On Time: [Off] Resume Time: [00:00:00]						WakeUp On LAN
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit						

The following table shows the items that you can customize on the Power menu page:

Item	Options	Description
WakeUp On LAN	Disabled Enabled	WakeUp On LAN
Resume On Time	Off On	Enabled wakes the system up at a specific time.
Resume Time	No Options	Specify the time when the system is to wake up. <Tab>, <Shift-Tab>, or <Enter> selects field.

### 3.8 Boot Menu:

PhoenixBIOS Setup Utility							
Main	Advanced	Security	Power	<b>Boot</b>	Server	Exit	
							Item Specific Help
Summary Screen: [Disabled]  ► Boot Priority							Display system configuration on boot
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit							

The following table shows the items that you can customize on the Boot menu page:

Item	Options	Description
Summary Screen	Disabled Enabled	Display system configuration on boot

### 3.8.1 Boot Priority Sub Menu

All the possible devices that you can boot from are automatically detected and listed on the page. The items with a '+' in front of it indicates that the item is a category with more devices nested under it. You can use <Enter> to display the nested devices. The first device listed is the first boot device. In the example shown below, the CD-ROM is the first boot device, followed by the ST380023AS-(P0) in the category of hard drive.

The Boot Priority Sub Menu looks like the following:

PhoenixBIOS Setup Utility							
Main	Advanced	Security	Power	<b>Boot</b>	Server	Exit	
Boot Priority							Item Specific Help
CD-ROM Drive -Removable Devices Legacy Floppy Drivers -Hard Drive ST380023AS-(P0) Bootable Add-in Cards MBA v8.2.5 Slot 0420 MBA v8.2.5 Slot 0421 LSI MPI Boot Support							Keys used to view or configure devices: <Enter> expands or collapses devices with a + or - <Ctrl-Enter> expands all <Shift-I> enables or disables a device. <+> and <-> moves the device up or down. <n> may move removable device between Hard Disk or Removable Disk. <d> Remove a device that is not installed.
F1 Help ESC Exit	↑↓ Select Item ←→ Select Menu	-/+ Change Values Enter Select	F9 Setup Defaults F10 Save and Exit				

### 3.9 Server Menu:

PhoenixBIOS Setup Utility							
Main	Advanced	Security	Power	Boot	<b>Server</b>	Exit	
							Item Specific Help
Display without KB Err Msg: [No]  ► Hardware Monitor  ► IPMI							Control the Post Error Message display or not when without KB.
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit							

The following table shows the items that you can customize on the Boot menu page:

Item	Options	Description
Display without KB Err Msg	Yes No	Control the Post Error Mesaage display or not when without KB

### 3.9.1 Hardware Monitor Sub Menu

The Hardware Monitor Sub Menu looks like the following:

PhoenixBIOS Setup Utility		Server
Hardware Monitor		Item Specific Help
CPU1-Fan1 Speed = 5000RPM CPU2-Fan1 Speed = 5000RPM CPU2-Fan2 Speed = No Function Front-Fan1 Speed = No Function Front-Fan2 Speed = No Function  CPU 1 Temperature = 63°C CPU 2 Temperature = 54°C On-Chip Temperature = 37°C  Vbat : 3.2894V Vcc(5V) : 5.1969V -12V : -12.2404V +12V : +12.960V Vcore0 : 1.5086V Vcore1 : 1.5036V VLDT(1.2V) : 1.1876 Vcc3(3.3V) : 3.2588V Vsb(3.3V) : 3.3064V CPU1(2.5V) : 2.6875V CPU2(2.5V) : 2.6875V CPU1(1.25V) : 1.3200V CPU2(1.25V) : 1.3366V		All items on this menu cannot be modified in user mode. If any items require changes, please consult your system Supervisor.
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit		

### 3.9.2 IPMI Sub Menu

The IPMI Sub Menu looks like the following:

PhoenixBIOS Setup Utility		
<b>Advanced</b>		
IPMI		Item Specific Help
BMC/Scorpio Configuration	[Enabled]	Enabling this selection will force the BIOS to Configuration IP Address
IP Address	[192.168.254.001]	
Subnet Mask	[255.255.255.000]	
Default Gateway	[192.168.254.000]	
IPMI Specification Version	(Unknown)	
BMC Firmware Version	(Unknown)	
System Event Logging	[Enabled]	
Existing Event Log number	0	
Event Log Control		
SYS Firmware Progress	[Disabled]	
BIOS POST Errors	[Enabled]	
F1 Help    ↑↓ Select Item    -/+ Change Values    F9 Setup Defaults ESC Exit   ←→ Select Menu   Enter Select ► Sub-Menu   F10 Save and Exit		

The following table shows the items that you can customize on the IPMI sub-menu page:

Item	Options	Description
BMC/Scorpio Configuration	Disabled Enabled	Enabling this selection will force the BIOS to Configuration IP Address
IP Address Subnet Mask Default Gateway	No options.	Display/Set IP Address, Subnet Mask, and Gateway.
System Event Logging	Disabled Enabled	Enable/Disable IPMI event logging. Disabling will still log events received via the system interface.
SYS Firmware Progress	Disabled Enabled	Enabling this selection will log POST Progress.
BIOS POST Errors	Disabled Enabled	Enabling this selection will log POST errors.



To learn more about the IPMI selections, refer to a separate Arima IPMI manual for detailed usage.



## 3.10 Exit Menu:

PhoenixBIOS Setup Utility							
Main	Advanced	Security	Power	Boot	Server	Exit	
							Item Specific Help
Exit Saving Changes Exit Discarding Changes Load Setup Defaults Discard Changes Save Changes							Exit System Setup and save your changes to CMOS.
F1 Help	↑↓ Select Item	-/+ Change Values		F9 Setup Defaults			
ESC Exit	←→ Select Menu	Enter Select ► Sub-Menu		F10 Save and Exit			

The following sections describe each of the options on this menu. Note that <Esc> does not exit this menu. You must select one of the items from the menu or menu bar to exit.

### Saving Changes

After making your selections on the Setup menus, select "Exit Saving Changes" or "Save Changes" to see a screen similar to the following:

Setup Confirmation	
Save configuration changes and exit now?	
[Yes]	[No]

Select Yes and press <Enter> to save the changes.

Both procedures store the selections displayed in the menus in CMOS (short for "battery-backed CMOS RAM") a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS.

During boot up, PhoenixBIOS attempts to load the values saved in CMOS. If those values cause the system boot to fail, reboot and press <F2> to enter Setup. In Setup, you can get the Default Values (as described below) or try to change the selections that caused the boot to fail.

### Exit Discarding Changes

Use this option to exit Setup without storing in CMOS any new selections you may have made. The selections previously in effect remain in effect.

### Load Setup Defaults

To display the default values for all the Setup menus, select "Load Setup Defaults" from the Main Menu. The program displays this message:

Setup Confirmation	
Load default configuration now?	
[Yes]	[No]

Select Yes and press <Enter> to load the default configuration.

If, during boot up, the BIOS program detects a problem in the integrity of values stored in CMOS, it displays these messages:

System CMOS checksum bad - run SETUP Press <F1> to resume, <F2> to Setup
---

The CMOS values have been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS.

Press <F1> to resume the boot or <F2> to run Setup with the ROM default values already loaded into the menus. You can make other changes before saving the values to CMOS.

## Discard Changes

If, during a Setup Session, you change your mind about changes you have made and have not yet saved the values to CMOS, you can restore the values you previously saved to CMOS.

Selecting “Discard Changes” on the Exit menu updates all the selections and displays this message:

Setup Confirmation
Load previous configuration now?
<input checked="" type="button" value="Yes"/> <input type="button" value="No"/>

Select Yes and press <Enter> to load the previous configuration.

## Save Changes

Selecting “Save Changes” saves all the selections without exiting Setup.

Setup Confirmation
Save configuration changes now?
<input checked="" type="button" value="Yes"/> <input type="button" value="No"/>

Select Yes and press <Enter> to save configuration changes and continue working in BIOS Setup. You can return to the other menus if you want to review and change your selections.

## 3.11 About the Boot Utilities

The MainBoard comes with the following boot utilities:

**Phoenix QuietBoot™:** Phoenix QuietBoot displays a graphic illustration rather than the traditional POST messages while keeping you informed of diagnostic problems.

**Phoenix MultiBoot™:** Phoenix MultiBoot is a boot screen that displays a selection of boot devices from which you can boot your operating system.

### 3.11.1 Using Phoenix QuietBoot

Right after you turn on or reset the computer, Phoenix QuietBoot displays the QuietBoot Screen, a graphic illustration created by the computer manufacturer instead of the text-based POST screen, which displays a number of PC diagnostic messages.

To exit the QuietBoot screen and run Setup, display the MultiBoot menu, or simply display the PC diagnostic messages, you can simply press one of the hot keys described below.

The QuietBoot Screen stays up until just before the operating system loads unless one of the following actions occurs:

Press <ESC> to display the POST screen

Press <F2> to enter Setup

POST issues an error message

The BIOS or an option ROM requests keyboard input

The following explains each of these situations.

When <ESC> is pressed	Press <ESC> switch to the POST screen and take one of two actions: <ol style="list-style-type: none"><li>1. If MultiBoot is installed, the boot process continues with the POST screen until the end of POST, and then displays the Boot First Menu, text-based with these options: A: Load the operating system from a boot device of your choice. B: Enter Setup. C: Exit the Boot First Menu (with &lt;Esc&gt;) and load the operating system from the boot devices in the order specified in Setup.</li><li>2. If MultiBoot is not installed, the boot process continues as usual.</li></ol>
Press <F2> to enter Setup	Press <F2> at any time during POST switch to the POST screen (if not already displayed) and enters Setup.
POST issues an error message	Whenever POST detects a non-fatal error, QuietBoot switches to the POST screen and displays the errors. It then displays this message: <div>Press &lt;F1&gt; to resume, &lt;F2&gt; to Setup Press &lt;F1&gt; to continue with the boot. Press &lt;F2&gt; if you want to correct the error in Setup.</div>
The BIOS or an option ROM requests keyboard input	If the BIOS or an Option ROM (add-on card) requests keyboard input, QuietBoot switches over to the POST screen and the Option ROM displays prompts for entering the information. POST continues from there with the regular POST screen.

### 3.11.2 Phoenix MultiBoot

Phoenix MultiBoot expands your boot options by letting you choose your boot device, which could be a hard disk, floppy disk, or CD ROM. You can select your boot device in Setup, or you can choose a different device each time you boot during POST by selecting your boot device in The Boot First Menu. MultiBoot consists of:

The Setup Boot Menu

The Boot First Menu

Refer to the Boot menu in BIOS setup for more information on Setup Boot Menu. The following describes the Boot First Menu.

#### The Boot First Menu

Display the Boot First Menu by pressing <ESC> during the POST. In response, the BIOS first displays the message, "Entering Boot Menu ..." and then displays the Boot Menu at the end of POST. Use the menu to select any of these options:

- \* Override the existing boot sequence (for this boot only) by selecting another boot device. If the specified device does not load the operating system, the BIOS reverts to the previous boot sequence.

- \* Enter Setup.

- \* Press <Esc> to continue with the existing boot sequence.

Boot Menu	
1.	CD-ROM Drive
2.	+Removable Devices
3.	+Hard Drive
4.	MBA v8.2.5 Slot 0420
5.	MBA v8.2.5 Slot 0421
6.	LSI MPI Boot Support
<Enter Setup>	

If there is more than one bootable hard drive, the first one in the Setup Boot menu is the one represented here.

## 3.12 BIOS Flash Upgrade Utility

Phoenix Phlash gives you the ability to update your BIOS from a floppy disk without having to install a new ROM BIOS chip.

Phoenix Phlash is a utility for "flashing" (copying) a BIOS to the Flash ROM installed on your computer from a floppy disk. A Flash ROM is a Read-Only Memory chip that you can write to using a special method called "flashing." Use Phoenix Phlash for the following tasks:

Update the current BIOS with a new version.

Restore a BIOS when it has become corrupted.

### 3.12.1 Executing Phoenix Phlash

You can run Phoenix Phlash to update or replace your current BIOS in Command Line Mode. To execute Phlash in this mode, move to the directory into which you have installed Phoenix Phlash and type "Phlash" at the prompt:

**C:\PHLASH16 [filename] /BBL /C /Mode=3**

Phoenix Phlash automatically updates or replaces the current BIOS with the one which your OEM or dealer supplies you.

Phlash may fail if your system is using memory managers, in which case the utility displays the following message:

**Cannot flash when memory managers are present.**

If you see this message after you execute Phlash, you must disable the memory manager on your system.

To do so, follow the instructions in the following sections.

#### Disabling Memory Managers

To avoid failure when flashing, you must disable the memory managers that load from CONFIG.SYS and AUTOEXEC.BAT. There are two recommended procedures for disabling the memory managers. One consists of pressing the <F5> key (only if you are using DOS 5.0 or above), and the other requires the creation of a boot diskette.

#### DOS 5.0 (or later version)

For DOS 5.0 and later, follow the two steps below to disable any memory managers on your system. If you are not using at least DOS 5.0, then you must create a boot diskette to bypass any memory managers (See Create a Boot Diskette, below).

1. Boot DOS 5.0 or later version. (In Windows 95, at the boot option screen, choose Option 8, "Boot to a previous version of DOS.")
2. When DOS displays the "Starting MS-DOS" message, press <F5>.

After you press <F5>, DOS bypasses the CONFIG.SYS and AUTOEXEC.BAT files, and therefore does not load any memory managers.

You can now execute Phlash.

#### Create a Boot Diskette

To bypass memory managers in DOS versions previous to 5.0, follow this recommended procedure:

3. Insert a diskette into your A: drive.
4. Enter the following from the command line: Format A: /S
5. Reboot your system from the A: drive.

Your system will now boot without loading the memory managers, and you can then execute Phlash.

Command:

**A:\> PHLASH16 SW300.100 /BBL /C /Mode=3**

Where:

PHLASH16	Phlash command name
SW300.100	Filename of new BIOS ROM supplied by dealer
/BBL	Flash the Boot Block
/C	Clear CMOS
/Mode=3	Update both the BIOS and DMI information (reset system DMI strings).

## APPENDIX I: Glossary

**ACPI (Advanced Configuration and Power Interface):** a power management specification that allows the operating system to control the amount of power distributed to the computer's devices. Devices not in use can be turned off, reducing unnecessary power expenditure.

**AGP (Accelerated Graphics Port):** a PCI-based interface which was designed specifically for demands of 3D graphics applications. The 32-bit AGP channel directly links the graphics controller to the main memory. While the channel runs only at 66 MHz, it supports data transmission during both the rising and falling ends of the clock cycle, yielding an effective speed of 133 MHz.

**ATAPI (AT Attachment Packet Interface):** also known as IDE or ATA; a drive implementation that includes the disk controller on the device itself. It allows CD-ROMs and tape drives to be configured as master or slave devices, just like HDDs.

**ATX:** the form factor designed to replace the AT form factor. It improves on the AT design by rotating the board 90 degrees, so that the IDE connectors are closer to the drive bays, and the CPU is closer to the power supply and cooling fan. The keyboard, mouse, USB, serial, and parallel ports are built-in.

**Bandwidth:** refers to carrying capacity. The greater the bandwidth, the more data the bus, phone line, or other electrical path can carry. Greater bandwidth results in greater speed.

**BIOS (Basic Input/Output System):** the program that resides in the ROM chip, which provides the basic instructions for controlling your computer's hardware. Both the operating system and application software use BIOS routines to ensure compatibility.

**Buffer:** a portion of RAM which is used to temporarily store data; usually from an application though it is also used when printing and in most keyboard drivers. The CPU can manipulate data in a buffer before copying it to a disk drive. While this improves system performance (reading to or writing from a disk drive a single time is much faster than doing so repeatedly) there is the possibility of losing your data should the system crash. Information in a buffer is temporarily stored, not permanently saved.

**Bus:** a data pathway. The term is used especially to refer to the connection between the processor and system memory, and between the processor and PCI or ISA local buses.

**Bus mastering:** allows peripheral devices and IDEs to access the system memory without going through the CPU (similar to DMA channels).

**Cache:** a temporary storage area for data that will be needed often by an application. Using a cache lowers data access times since the information is stored in SRAM instead of slower DRAM. Note that the cache is also much smaller than your regular memory: a typical cache size is 512KB, while you may have as much as 4GB of regular memory.

**Closed and open jumpers:** jumpers and jumper pins are active when they are “on” or “closed”, and inactive when they are “off” or “open”.

**CMOS (Complementary Metal-Oxide Semiconductors):** chips that hold the basic startup information for the BIOS.

**COM port:** another name for the serial port, which is called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another). Parallel ports transmit the bits of a byte on eight different wires at the same time (that is, in parallel form, eight bits at the same time).

**DDR (Double Data Rate):** a technology designed to double the clock speed of the memory. It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output.

**DIMM (Dual In-line Memory Module):** faster and more capacious form of RAM than SIMMs, and do not need to be installed in pairs.

**DIMM bank:** sometimes called DIMM socket because the physical slot and the logical unit are the same. That is, one DIMM module fits into one DIMM socket, which is capable of acting as a memory bank.

**DMA (Direct Memory Access):** channels that are similar to IRQs. DMA channels allow hardware devices (like soundcards or keyboards) to access the main memory without involving the CPU. This frees up CPU resources for other tasks. As with IRQs, it is vital that you do not double up devices on a single line. Plug-n-Play devices will take care of this for you.

**DMI:** A specification that establishes a standard framework for managing networked computers. DMI covers hardware and software, desktop systems and servers, and defines a model for filtering events and describing interfaces.

**DRAM (Dynamic RAM):** widely available, very affordable form of RAM which loses data if it is not recharged regularly (every few milliseconds). This refresh requirement makes DRAM three to ten times slower than non-recharged RAM such as SRAM.

**ECC (Error Correction Code or Error Checking and Correcting):** allows data to be checked for errors during run-time. Errors can subsequently be corrected at the same time that they’re found.

**EEPROM (Electrically Erasable Programmable ROM):** also called Flash BIOS, it is a ROM chip which can, unlike normal ROM, be updated. This allows you to keep up with changes in the BIOS programs without having to buy a new chip.

**ESCD (Extended System Configuration Data):** a format for storing information about Plug-n-Play devices in the system BIOS. This information helps properly configure the system each time it boots.

**Firmware:** low-level software that controls the system hardware.

**Form factor:** an industry term for the size, shape, power supply type, and external connector type of the Personal Computer Board (PCB) or motherboard. The standard form factors are the AT and ATX.

**IDE (Integrated Device/Drive Electronics):** a simple, self-contained HDD interface. It can handle drives up to 8.4 GB in size. Almost all IDEs sold now are in fact Enhanced IDEs (EIDEs), with maximum capacity determined by the hardware controller.

**IDE INT (IDE Interrupt):** a hardware interrupt signal that goes to the IDE.

**I/O (Input/Output):** the connection between your computer and another piece of hardware (mouse, keyboard, etc.)

**IRQ (Interrupt Request):** an electronic request that runs from a hardware device to the CPU. The interrupt controller assigns priorities to incoming requests and delivers them to the CPU. It is important that there is only one device hooked up to each IRQ line; doubling up devices on IRQ lines can lock up your system. Plug-n-Play operating systems can take care of these details for you.

**Latency:** the amount of time that one part of a system spends waiting for another part to catch up. This occurs most commonly when the system sends data out to a peripheral device and has to wait for the peripheral to spread (peripherals tend to be slower than onboard system components).

**NVRAM:** ROM and EEPROM are both examples of Non-Volatile RAM, memory that holds its data without power. DRAM, in contrast, is volatile.

**OPROM:** Firmware on adapter cards that control bootable peripherals. The system BIOS interrogates the option ROMs to determine which devices can be booted.

**Parallel port:** transmits the bits of a byte on eight different wires at the same time.

**PCI (Peripheral Component Interconnect):** a 32 or 64-bit local bus (data pathway) which is faster than the ISA bus. Local buses are those which operate within a single system (as opposed to a network bus, which connects multiple systems).

**PCI PIO (PCI Programmable Input/Output) modes:** the data transfer modes used by IDE drives. These modes use the CPU for data transfer (in contrast, DMA channels do not). PCI refers to the type of bus used by these modes to communicate with the CPU.



**PCI-to-PCI bridge:** allows you to connect multiple PCI devices onto one PCI slot.

**PnP (Plug-n-Play):** a design standard that has become ascendant in the industry. Plug-n-Play devices require little set-up to use. Devices and operating systems that are not Plug-n-Play require you to reconfigure your system each time you add or change any part of your hardware.

**RAID (Redundant Array of Independent Disks):** a way for the same data to be stored in different places on many hard drives. By using this method, the data is stored redundantly and multiple hard drives will appear as a single drive to the operating system. RAID level 0 is known as striping, where data is striped (or overlapped) across multiple hard drives, but offers no fault-tolerance. RAID level 1 is known as mirroring, which stores the data within at least two hard drives, but does not stripe. RAID level 1 also allows for faster access time and fault-tolerance, since either hard drive can be read at the same time. RAID level 0+1 is both striping and mirroring, providing fault-tolerance, striping, and faster access all at the same time.

**SDRAM (Synchronous Dynamic RAM):** called as such because it can keep two sets of memory addresses open simultaneously. By transferring data alternately from one set of addresses and then the other, SDRAM cuts down on the delays associated with non-synchronous RAM, which must close one address bank before opening the next.

**Serial port:** called as such because it transmits the eight bits of a byte of data along one wire, and receives data on another single wire (that is, the data is transmitted in serial form, one bit after another).

**Sleep/Suspend mode:** in this mode, all devices except the CPU shut down.

**SRAM (Static RAM):** unlike DRAM, this type of RAM does not need to be refreshed in order to prevent data loss. Thus, it is faster and more expensive.

**SMBIOS:** The system management specification addresses how motherboard and system vendors present management information about their products in a standard format by extending the BIOS interface on Intel architecture systems.

**Standby mode:** in this mode, the video and hard drives shut down; all other devices continue to operate normally.

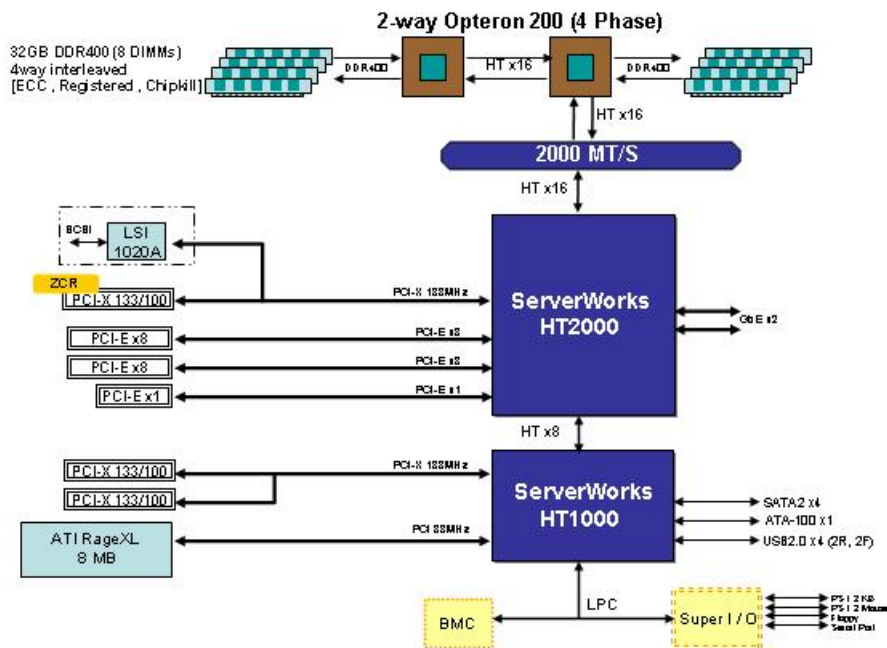
**UltraDMA-33/66/100:** a fast version of the old DMA channel. UltraDMA is also called UltraATA. Without a proper UltraDMA controller, your system cannot take advantage of higher data transfer rates of the new UltraDMA/UltraATA hard drives.

**USB (Universal Serial Bus):** a versatile port. This one port type can function as a serial, parallel, mouse, keyboard or joystick port. It is fast enough to support video transfer, and is capable of supporting up to 127 daisy-chained peripheral devices.

**ZCR (Zero Channel RAID):** ZCR card provides RAID-5 solution by working with the onboard SCSI/SATA/SATA-II chip through special PCI-X slot with Intel RAIDIOS logic, thus lowering cost of RAID-5 solution

## APPENDIX II: Block Diagram

For your convenience, we have included this block diagram to show the internal design of the motherboard in order to better aid you in troubleshooting. This diagram shows the bus and the channel of data flow. A good understanding of this diagram can help you clarify the configuration choices for your own optimization.



## APPENDIX III: FAQ